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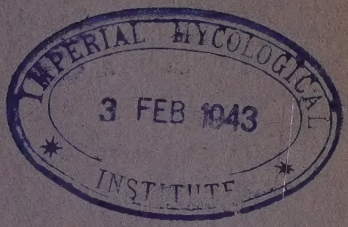

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NOTE :—In certain cases it is not possible to check references in the original publication. Such references are marked with an asterisk.

REVIEW ARTICLES

(1) **" Antibacterial Agents derived from Micro-Organisms."**

(2) **" The Present Position of Phenothiazine as an Anthelmintic."**

Reprints (price 1/- and 1/6 respectively) obtainable from :- Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.

The Editor will be glad to receive publications relating to Veterinary Science and cognate subjects in order that they may be dealt with in the *Veterinary Bulletin.*

Reports of Departments, Special Reports, reprints, etc., etc., should be sent as soon as they are issued.

Books for Review.

The Editor will be glad to receive books for review in the *Veterinary Bulletin.*

Bulletins on disease subjects written for farmers and " popular " articles of a similar nature are not included in the *Veterinary Bulletin.* Those of a sufficiently important nature, are, however, included in *Index Veterinarius* ; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin.*

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 13.] February, 1943. [No. 2.

DISEASES CAUSED BY BACTERIA AND FUNGI

—. (1942). **Discussion on the Control of the Diseases of Cattle Inimical to Man. Mastitis and Streptococcal Infections.** [Speakers: STABLEFORTH, A. W., ALLISON, V. D., HIGNETT, S. L., CRUICKSHANK, R., STEELE-BODGER, H. W., PARISH, H. J., FRANCIS, J., HUGHES, D. L., MCEWEN, A. D., EDWARDS, S. J., EDWARDS, J. T., MATTICK, A. T. R., BARKER, J. R.] —*Proc. R. Soc. Med.* **35**. 625–634. 276†

STABLEFORTH reported on attempts to eradicate *Streptococcus agalactiae* mastitis by three-monthly cultural milk tests (plate method) and segregation or sale of infected animals. New infections continued to appear, however, so a liquid enrichment medium was used which detected many cases which had been undetected by the plate method. He considered that, as part of a national scheme, regular cultural examinations are impracticable. Although, on the whole, clinical symptoms increase with the age of infection, many cows can carry a heavy infection for years without showing marked symptoms, whilst in other cows in the same herd the symptoms are obvious.

ALLISON presented statistics on infection of human beings with streptococci grouped after Lancefield's method and referred to the view, now widely accepted, that milk-borne streptococcal outbreaks in man are the result of udder infection. He states that the main reservoir of *Str. pyogenes* is the human throat, and that all udder infections of the cow with this organism may ultimately be traced to this source. Milk-borne streptococcal outbreaks in human beings, due to contamination of the milk after it has been drawn, are usually caused by Lancefield's group A *Str. pyogenes*.

HIGNETT reported the results of treatment of mastitis by the injection of antiseptic solutions into the udder *via* the teat canal, accompanied by the administration of sulphonamides by the mouth.

STEELE-BODGER referred to the prevalence of "black spot" teat lesions and to the prophylactic value against mastitis of antiseptic emulsions left in the teats. FRANCIS and HUGHES discussed the nature and significance of *Str. agalactiae* in the udder, its significance in mastitis, and bacteriological diagnosis. MCEWEN reported encouraging therapeutic results with sulphonamide E.O.S. and with 4 : 4′-diamino-diphenylsulphone. S. J. EDWARDS emphasized the paramount importance of the farmer's part in mastitis control and referred to promising therapeutic results with gramicidin.

J. T. EDWARDS compared bovine mastitis to chronic mastitis of women, now believed to be due to an excess of oestrogens, and suggested that it might be advisable to produce by selective breeding a cow which would be of lower milk-yielding capacity but which would not be so liable to disturbances of the udder.—H. V. HUGHES.

WOOD, A. J. (1940). **A Preliminary Study of the Dehydrogenases of Streptococcus mastitidis.**—*Thesis, Cornell.* pp. 98. 277

W. calls attention to the necessity in these studies of a carefully planned medium containing an adequate supply of the known essential growth accessories, an adequate but not excessive buffer system, and suitable sources of carbon and nitrogen for the growing of cultures from which cell suspensions are to be prepared. A suitable medium consists of Bacto-tryptose 1%, Bacto-yeast extract 1·5%, di-potassium phosphate 0·5%, and carbon source 0·1%. It has been shown that the organism is capable of taking up in excessive amounts some agent governing the rate of oxidation.

Consideration has been given to the influence of a variety of physical and chemical factors on the rate of oxidation. A satisfactory set of operating conditions for the Thunberg tubes has been developed. The work involves a study of the effect of dye concentration, cell age and concentration, and temperature, in relation to the measurement of the oxidation capabilities of cell suspensions.

Str. mastitidis is capable of oxidizing the carbohydrates glucose, fructose, galactose, mannose, sucrose, maltose, trehalose, and lactose; ethyl, *n*-propyl, iso-propyl, *n*-butyl, iso-butyl, sec.-butyl, *n*-amyl, methyl-*n*-propyl-carbinol, methyl-iso-propyl-carbinol, and ter.-amyl alcohols; lactic and malic acids.—H. L. GILMAN.

SMITH, P. A., & SHERMAN, J. M. (1942). **The Lactic Acid Fermentation of Streptococci.**—*J. Bact.* **43**. 725–731. 278

The authors have investigated the question whether all streptococci are "homofermentative organisms" and the percentage of lactic acid which they yield from the fermentation of glucose. Data were obtained for all of the better known species. The tests were made on washed cells suspended in a phosphate-buffered solution; in some cases under strictly anaerobic conditions, in others without anaerobic precautions, although in these cases the fermentations were essentially anaerobic.

It was found that the average yield of lactic acid

† Abstracts will be numbered serially throughout volume 13 of the *Veterinary Bulletin*, the numbers being printed in black type at the end of each title. These numbers will be used in giving cross references to abstracts which might equally well appear in more than one section of the journal.

from glucose was 80–90% in the case of the pyogenic streptococci (those belonging to Lancefield's groups A, B, C, E, F, G & H) and over 90% for the *viridans*, lactic, and enterococcus groups. This suggested that the slightly lower average efficiency of the pyogenic streptococci may be significant.

[The term "homofermentative organisms" is presumably used for those which possess the same enzymes and whose action on a given substrate is therefore similar, *e.g.* as above the production of lactic acid from glucose.]—D. L. HUGHES.

TODD, E. W. (1942). **The Leucocidin of Group A Haemolytic Streptococci.**—*Brit. J. exp. Path.* **23.** 136–145. **279**

T. describes a new method of titrating leucocidin. The test depends on the fact that agglutination of normal leucocytes in saline by sodium hydroxide does not occur if the leucocytes have been destroyed by leucocidin. Serial dilutions in saline of the fluid to be tested for leucocidin are mixed with leucocyte suspension, and incubated in the water-bath at 37°C. for 1 hour. Normal sodium hydroxide, and kaolin (to facilitate the reading), are added to each tube and the mixtures are agitated. If the leucocytes are undamaged, agglutination occurs. Lysed leucocytes form a uniform suspension with the kaolin.

Streptolysin O has a powerful lytic action on leucocytes when tested in this way in the presence of reducing agents, while streptolysin S has no demonstrable action. Red blood corpuscles are lysed more rapidly, and by much smaller concentrations of streptolysin. So that in a mixture of red and white cells, the lysin is rapidly taken up by the red cells, before it has time to affect the leucocytes.

The ratios of the neutralizing doses of antistreptolysin O sera for leucocidin and haemolysin support the view that streptolysin O is alone responsible for the destruction of red and white cells.

There is no correlation between the virulence of a culture for mice and its ability to produce streptolysin O *in vitro*. Antistreptolysin O has no therapeutic action, and when given along with sulphanilamide to mice artificially infected with haemolytic streptococci, it tends to diminish the effectiveness of the drug.

Leucocytes are undamaged by oxygen-labile tetanolysin and pneumolysin. The oxygen-labile *Clostridium welchii* θ toxin has a slight lytic action; oxygen-stable *Cl. welchii* α toxin fails to lyse leucocytes. —ISOBEL W. BURTON.

*RICHOU, R., & HOLSTEIN, G. (1941). Contribution à l'étude des mammites de la vache, et en particulier de la mammite staphylococcique : son traitement par l'anatoxine spécifique. [**Bovine Staphylococcal Mastitis and its Treatment with Anatoxin**].—*Bull. Acad. vét. Fr.* **14.** 100–102. [Abst. from abst. in *Bull. Inst. Pasteur.* **40.** 64]. **280**

Staphylococci were found in the milk of cows both with and without mastitis. These organisms are always potentially dangerous, especially if the animal contracts foot and mouth disease, which is often complicated by staphylococcal mastitis. Specific anatoxin has given good curative results, when given every five days.

BOI, F. (1940). Ricerche sui caratteri differenziali fra stafilococchi delle infezioni contagiose mammarie degli ovini e dei caprini e stafilococchi saprofitici del latte. [**Differential Characters of Staphylococci from Cases of Contagious Mastitis in Sheep and Goats and Saprophytic Staphylococci from Milk**].—*Biochim. Terap. sper.* **27.** 103–114. [English, French and German summaries]. **281**

It was not possible to distinguish between staphylococci from these two main sources by means of milk coagulation tests, haemolysis, heat resistance, trypaflavine and peptone agglutination, reduction of certain dyes, or sugar fermentation. They could, however, be differentiated by the Daranyi test (coagulation of citrated blood).

JONES, E. R. (1942). **The Isolation of *B. anthracis* from Industrial Material, with Special Reference to the Resistance of the Spores to Heat.**—*J. Path. Bact.* **54.** 307–314. **282**

Experiments were carried out which showed that the majority of spores of *Bacillus anthracis* were killed when heated for 2 min. at 80°C. and that a temperature of 65°C. for 5 min. was necessary to kill spores in infected industrial material. A method is described for the recovery of *B. anthracis* from industrial material and Ponder's method for the demonstration of McFadyean's methylene blue reaction is explained.—J. C. BUXTON.

BUZA, L. (1939). A lépfenebacillus versejtoldó hatása. [**Haemolytic Effect of *Bacillus anthracis***].—*Thesis, Budapest.* pp. 14. [German summary]. **283**

B. compared the haemolytic power of 40 virulent and 25 attenuated *B. anthracis* strains with that of the saprophytes *B. anthracoides*, *B. pseudoanthracis* and *B. anthracisimilis*. He found that the saprophytes were haemolytic for sheep red corpuscles in broth at pH 7·1, while none of the anthrax strains was haemolytic.

On blood agar, colonies of virulent *B. anthracis* strains rendered the agar transparent and greenish-yellow, but only underneath the colonies themselves and without any surrounding clearance zone. Attenuated *B. anthracis* strains did not cause haemolysis in this medium.

The saprophytes caused haemolysis in a zone up to 1 mm. outside the edges of the colonies after six hours, and the greenish-yellow colour caused by *B. anthracis* was not produced.

Under anaerobic conditions the saprophytes were haemolytic, while *B. anthracis* was not.

No oxyhaemoglobin could be demonstrated spectroscopically in the transparent area underneath *B. anthracis* colonies, while it was observed in the reddish-coloured area surrounding the colonies of the saprophytes.

The conclusion is drawn that differences in haemolytic power may serve as a means of distinguishing between *B. anthracis* and the anthrax-like saprophytes without microscopic examination, and also as indication of the degree of virulence of anthrax strains.

MEYN, A. (1942). Zur Frage der tuberkulösen Bakteriämie der Tiere. [**Tuberculous Bacteraemia in Animals**].—*Berl. Münch. tierärztl. Wschr.* June 12th. 184. **284**

M. examined a series of blood samples from tuberculous animals for the presence of tubercle bacilli and found that the bacilli are seldom demonstrable in the blood during life. Positive results were more frequently obtained in cases of avian than in mammalian TB. (seven out of 45). In blood samples taken at slaughter or P.M., however, positive findings were much more frequent. In all the cases of tuberculous bacteraemia seen, tubercle bacilli were present in tissues and muscles, even though no TB. lesions were present in the muscles.—J. CSONKA.

KELLER, H. (1941). Die Magentuberkulose des Schweines unter Besonderer Berücksichtigung der regionären Lymphknoten und der fleischhygienischen Bedeutung. [**Gastric TB. of the Pig with Special Reference to the Regional Lymph Nodes and their Importance at Meat Inspection**].—*Arch. wiss. prakt. Tierheilk.* **77.** 127–155. **285**

German meat inspection regulations require condemnation of the stomach when the gastric lymph nodes are tuberculous. There are, however, very few records

of gastric TB. in the pig, in spite of the frequent occurrence of lesions in the gastric lymph nodes. K. has studied both the incidence of stomach lesions and the relationship of TB. of the gastric nodes to the presence of the disease in neighbouring nodes. The gastric nodes are affected only when there is TB. of the portal (hepatic) or the coeliac lymph nodes, or both. In 50 pigs with TB. of the gastric nodes the stomach was carefully examined, both macroscopically and histologically. Three cases of gastric TB. were found, only one being visible macroscopically, and in none of them were acid-fast bacilli demonstrated in stained sections, although the histological features indicated TB. In ten pigs with tuberculous gastric nodes, portions of the stomach were examined culturally for tubercle bacilli, but in all cases the results were negative. The gastric lesions consisted of submiliary tubercles situated in lymph follicles within the mucosa or submucosa and such foci probably arise from tubercle bacilli in the gastric contents. Macroscopic TB. of the stomach may also possibly develop from retrograde spread from the adjacent lymph nodes, gastric and portal.

These results challenge the view that infection of the gastric nodes is indicative of TB. of the stomach: it appears probable that these nodes become affected by lymph vessel anastomoses between the gastric and portal nodes or by direct infection from the duodenum. K. suggests amendment of the regulations so that the stomach is condemned only when there is macroscopic evidence of gastric TB. or when the gastric nodes are affected in the absence of lesions in the portal and coeliac nodes (not so far recorded). It is estimated that this would bring about a saving of " meat " to the value of 320,000 R.M. per annum.—E. G. WHITE.

WEBSTER, R. (1941). **Studies in Tuberculosis. II. The Relative Incidence of Human and Bovine Types of Mycobacterium Tuberculosis in Human Disease in Victoria.**—*Med. J. Aust.* July 19th. 49–55. **286**

Bovine type bacilli were found in non-pulmonary tuberculous material from 11 (8·9%) of 123 children of 14 years of age or younger, and in none of 183 adults. The decline from the 1932 figure of 25·9% in children is correlated with the introduction of tuberculin testing of dairy cattle.

Strains were classified as human if they gave a vigorous and eventually luxuriant and pigmented growth in primary culture, or in first subculture, and in the presence of glycerin. Any strains not showing these characters were tested for their virulence in rabbits, and were classified as bovine only if virulent. —A. W. BANKS.

FELDMAN, W. H., & MOSES, H. E. (1942). **An Investigation to Determine the Sensitizing Agent in Cattle Tested with Mammalian and with Avian Tuberculins.**—*Amer. J. vet. Res.* **3.** 3–9. **287**

101 cattle, which gave positive reactions to official mammalian and or avian tuberculin 60 days after they had been recorded as doubtful reactors to mammalian tuberculin alone, were slaughtered and subjected to careful P.M. examination, attempts being made to demonstrate the presence of bacilli by cultural methods and by g. pig inoculation with emulsions of selected tissues. The cases were divided into five groups and the results appear to confirm the observation that many cattle, presumably sensitized to the bovine organism, will react to an intradermal test with avian type tuberculin. In many cases the laboratory methods employed were incapable of determining the agent responsible for positive reactions to either or both tuberculin tests. Further, *Actinomyces* would seem to be worthy of some consideration as a nonspecific sensitizing agent. —J. LOCHIEL MCGIRR.

RIORDAN, J. T. (1942). **Collodion-Particle Agglutinative Tests in Detection of Antigen Derived from Tubercle Bacilli.**—*Proc. Soc. exp. Biol., N.Y.* **49.** 622–624. **288**

Immunological tests were carried out on a single sample of horse antiserum, the collodion particle technique [see CANNON & MARSHALL, *V. B.* **11.** 380.] being compared with the precipitin test. The antigens used consisted of four Old Tuberculins (O.T.), two tuberculo-protein derivatives (P.P.D. and T.P.T.) three polysaccharides from human tubercle bacilli and one from the leprosy bacillus, one phosphatide suspension, and several crude aqueous extracts from dried tubercle bacilli. Reactions were unsatisfactory with the phosphatide suspensions (positive with normal serum) and the protein derivatives (negative throughout), but with the remaining three antigens the collodion technique was about ten times as delicate as the direct precipitin test. —J. P. GARDNER.

MORRIS, R. P. (1942). **Collodion-Agglutination Test in Human Tuberculosis.**—*Proc. Soc. exp. Biol., N.Y.* **50.** 172–173. **289**

The technique of CANNON & MARSHALL [*V. B.* **11.** 380.] was used, collodion particles coated with antigen by adsorption from Old Tuberculin and from solutions of " purified tuberculoprotein " being tested over a period of several months with normal and tuberculous human and rabbit sera. A few undoubtedly specific agglutination reactions were obtained, but the data as a whole were insignificant because of the high proportion of false reactions due to nonspecific factors. Even when most of the causes of false reactions were removed, by the use of fresh inactivated serum with freshly prepared collodion particles under standard conditions of incubation at pH close to the iso-electric point of tuberculoprotein, only 4% of human tuberculous sera gave specific positive reactions. A high proportion of negative aggln. reactions were shown both with patients reacting positively to the cutaneous test, and with patients showing active TB.

[The collodion-aggln. test therefore seems to be no better than the unsatisfactory ordinary precipitin reaction which, from the literature quoted, has been found positive in about 12% of cases when purified antigen is used.]—J. P. GARDNER.

SOLTYS, M. A. (1942). **Cultivation of *Mycobacterium tuberculosis* in a Medium of Minced Chick Embryo in Tyrode's Solution.**—*J. Path. Bact.* **54.** 375–377. **290**

It is shown that primary cultures of avian, bovine and human strains of *Mycobact. tuberculosis* can be grown on a medium of 2% chick embryo made up in Tyrode's solution and that, although the avian type can be subcultivated for a few generations, subcultures of the human and bovine types cannot be obtained on this medium.—J. C. BUXTON.

*VERGE, J., & SENTHILLE, F. (1941). I. Résultats de l'inoculation chez le chien de bacilles tuberculeux morts enrobés dans l'huile de vaseline.—II. Mise en évidence et titrage dans le sérum du chien des anticorps apparus à la suite de l'inoculation de bacilles tuberculeux morts. **[I. Results of Inoculating Dogs with Dead Tubercle Bacilli in Liquid Paraffin. II. Demonstration and Titration of Serum Antibodies Following Inoculation].**—*C. R. Soc. Biol. Paris.* **135.** 817 and 891. [Abst. from abst. in *Bull. Inst. Pasteur.* **40.** 73]. **291**

The authors produced pulmonary TB.-like lesions in dogs by intratesticular injection of dead tubercle

bacilli in liquid paraffin, but failed to do so by injection by other routes or by the same route without liquid paraffin.

Injection of dead tubercle bacilli into dogs by any route resulted in antibody formation, which reached its height in three weeks and sank again to a low level after about three months.

GUÉRIN, C., NÈGRE, L., & BRETEY, J. (1941). Vaccination antituberculeuse des jeunes bovidés par le BCG au moyen de scarifications cutanées. **[BCG Vaccination of Young Bovines by Scarification].**—*Bull. Acad. vét. Fr.* **14.** 41–45. [Abst. from abst. in *Bull. Inst. Pasteur.* **40.** 82]. **292**

One eight day old calf, three heifer calves of 10–15 days of age and one heifer of four months were inoculated with BCG by scarification on the front of the head. The affected skin became and remained indurated for 4–5 weeks and the animals were sensitive to the intradermal tuberculin test from 15 days to six weeks after scarification. [No data given in abst. on immunity conferred against TB.]

See also absts. **467, 473** (Tuberculosis).

SAVINO, E., & ACUÑA, C. (1941). Estudio sobre las bacterias ácido-resistentes aisladas de ratas grises. Su relación con la lepra murina. **[Acid-Fast Bacteria from Grey Rats and their Relation to Rat Leprosy].**—*Rev. Inst. Bact., B. Aires.* **10.** 275–291. **293**

The authors examined 1,112 grey rats and in 14 found acid-fast bacilli in the inguinal lymph nodes. In two cases the bacilli were arranged in rosette formation described as characteristic in rat leprosy.

The authors give the characteristics of the bacilli which they succeeded in cultivating in Löwenstein's and Petragnani's media.—MILLER WATSON.

FROBISHER, M., Jr., PARSONS, E. I., & T'UNG, T. (1942). **The Use of Chicks in Testing the Virulence of Corynebacterium diphtheriae. Comparison of Results with the Rabbit Virulence Test in 1,000 Strains.**—*Amer. J. Hyg.* **35.** 381–385. **294**

In a study of a thousand strains of corynebacteria on chicks 7–20 days old, as compared with the reactions of rabbits to intradermal injection of the same strains, there was very close agreement in the results. The use of chicks for the routine testing of virulence is discussed. —J. C. BUXTON.

SOLONITSYN, M. O., & ZHALOBOVSKIĬ, I. L. (1940). Opyt polucheniya ot loshadeĭ-malleinshchikov svobodnykh ot sapa zherebyat. **[Healthy Offspring from Positive Mallein Reactors].**—*Sovyet. Vet.* No. 1. pp. 14–16. **295**

Six hundred foals born of dams giving a positive reaction to mallein were kept under observation from January, 1936 to November, 1939, with a view to eliminating all other possible sources of glanders infection. The foals were divided into three groups and were examined clinically twice a year, in autumn and spring; repeated ocular and subcutaneous mallein tests and complement-fixation tests were made at intervals of a few days. All positive reactors were eliminated. At the end of 1939, 34 foals were killed and examined P.M. No glanders lesions were found. The remainder of the foals did not react and were ultimately regarded as free of glanders infection.

It is recommended that all foals born of mallein reactors should be weaned at 4–5 months, isolated from other animals, kept under observation for at least two years, and periodically subjected to the tests mentioned above, positive reactors being eliminated. It was hoped thus to eradicate glanders in the U.S.S.U. within a short time.

LÜTJE. (1942). Rotlaufverdacht und Rotlauffeststellungen bei notgeschlachteten Schweinen. **[Cases of Suspected and Confirmed Swine Erysipelas in Pigs Slaughtered in Emergency].**—*Z. Fleisch- u. Milchhyg.* **52.** 159–163. **296**

This is an analysis of some years' bacteriological diagnosis work on pigs slaughtered in emergency, with special reference to swine erysipelas (S.E.). Two groups of figures covering contiguous periods are given. (a) Out of 8,525 cases, S.E. was suspected in 799 and was confirmed in 348. The true causes of disease in the balance of 438 cases were anthrax (14), salmonella infection (47), streptococcal infection (36), pasteurella infection (2), swine fever (197), and foot and mouth disease (6); the rest were bacteriologically negative.

(b) Out of 1,520 cases, S.E. was suspected in 225 and confirmed in 129 cases. The remaining 96 cases were streptococcal infection (19), pasteurella infection (2), fibrinous polyserositis (6), foot and mouth disease (1); the rest were bacteriologically negative.

The suspected and confirmed cases of S.E. are discussed with special reference to the Meat Inspection Law, which recognizes generalized septicaemic S.E. infection and local S.E. infection (skin and heart). Carcasses in the former category are wholly condemned and those in the latter category allowed to be sold on the Freibank. L. proved that many of those designated " localized cases " were actually septicaemically infected and so concludes that the Law requires revision.

Baeteriological methods used are described.—J. E.

SAXINGER, G. (1942). Stellungnahme zu Fragen über die Schutzimpfung gegen Schweinerotlauf. **[Questions and Answers about Immunization against Swine Erysipelas].**—*Berl. Münch. tierärztl. Wschr.* May 15th. 151–156. **297**

Nineteen questions about scientific and technical matters arising out of immunization against S.E. by culture and antiserum are answered by S., who is on the staff of the Asid Serum Institute, Dessau. Information, advice, and a digest of expert opinion are given. Interested readers should see the original article.—J. E.

BESSONOVA, A. A., MOLODTSOVA, P. F., MOSOLOVA, O. N., OSOLINKER, B. E., KRAĬNOVA, A. N., PRONIN, V. A., TIMOFEEVA, R. I., SHAPOSHNIKOV, M. S., SOKOLINSKAYA, A. G., KASHKINA, N. I., PETRUNINA, A. M., GORYUNOVA, K. A., & TEMYAKOVA, A. S. (1940). O diferentsiatsii B. pestis i B. pseudotuberculosis rodentium Pfeiffer'a pri pomoshchi chumnovo bakteriofaga. **[Differentiation of *Pasteurella pestis* and *Past. pseudotuberculosis* by Means of a *Past. pestis* Bacteriophage].**—*Rev. Microbiol., Saratov.* **17.** 228–231. [English summary]. **298**

The effect was investigated of two strains of *Past. pestis* bacteriophage on 214 *Past. pestis* strains and 21 *Past. pseudotuberculosis* strains. Four series of experiments were carried out with each strain; in one the phage was added along with the bacterial inoculum and in the other it was added after growth had proceeded in the incubator for 5–7 hours.

All the *Past. pestis* strains were completely lysed within 2–5 hours, but the *Past. pseudotuberculosis* strains were unaffected after this interval.

BERLIN, A. L., & BORZENKOV, A. K. (1940). Ramnozopozitivnye varianty B. pestis i diferentsial'no-diagnosticheskoe znachenie sredy s ramnozoĭ. **[Rhamnose Positive Variants of *Pasteurella pestis* and the Differential Diagnostic Value of a Rhamnose Medium].**—*Rev. Microbiol., Saratov.* **17.** 238–246. [English summary]. **299**

The authors consider that when rhamnose media are used to distinguish between *Past. pestis* and *Past.*

pseudotuberculosis, the results should be recorded within 2–3 days.

SOLOMKIN, P. S., & ANDREEV, P. N. (1941). K voprosu o poluchenii vaktsiny protiv paratifa porosyat. [**Preparation of Vaccines against Piglet Paratyphoid**].—*Veterinariya, Moscow.* No. 1. pp. 40–43. [French summary]. **300**

Immunization experiments were conducted in rabbits, g. pigs, and piglets with an oil formol vaccine, and with a vaccine prepared with precautions against denaturation as follows. Growths of *Salmonella cholerae-suis*, *S. paratyphi-B*, and *S. enteritidis* were suspended in distilled water and centrifuged; the sediment was suspended in 8% saccharose solution, shaken for half-an-hour and incubated for 24 hours at 55°C., oil of sunflower seeds was added to give a final concentration of 500,000,000 organisms per ml. The oil formol vaccine was ineffective, but the undenatured vaccine provided sufficient immunity to protect g. pigs from artificial infection and piglets from infection by exposure. Small-scale experiments only were conducted.—A. MOLDAWSKY.

SCHMIDT, K. (1942). Über die Genusstauglichkeit der an Geflügeltyphus erkrankten Hühner. [**Suitability as Food of Fowls Infected with *Salmonella gallinarum***].—*Berl. Münch. tierärztl. Wschr.* June 12th. 192–193. **301**

Experiments carried out by S. demonstrated that thorough boiling or roasting is sufficient to kill *S. gallinarum* and *S. pullorum* in flesh and organs of slaughtered fowls.—J. CSONKA.

See also abst. **469** (Food poisoning).

DIERNHOFER, K. (1942). Der gegenwärtige Stand einiger wichtiger Fragen der Abortusbekämpfung. [**The Present Status of some Important Questions on Bovine Brucellosis Control**].—*Wien. tierärztl. Mschr.* **29.** 193–199. **302**

A general discussion on conventional lines.

—R. S. DE ROPP.

NÉMETH, S. (1939). Adatok a szarvasmarhabrucellosis járványtanához. [**Observations on the Periodicity of the Manifestations of Brucellosis**].—*Thesis, Budapest.* pp. 11. [German summary]. **303**

This is a description of conditions in two infected herds of 69 and 46 cows respectively, regarding which complete records of abortions, sterility, calf deaths and calf diseases had been kept for ten and four years respectively. No control measures of any kind had been taken.

These records are set out in two graphs and a table; there was a periodic fluctuation in the number of abortions and calf deaths at intervals of two years.

The curve indicating calf losses through sterility ran almost parallel to the curve indicating calf losses through abortion and calf deaths, but its values were about twice as high. Losses due to abortions, sterility, and calf deaths attained, and in some years exceeded, 40–50% of the total number of animals kept.

HOFSTAD, M. S. (1942). **The Changes Produced by *Brucella abortus* in the Milk and Udder of Cows Infected with Bang's Disease.**—*Cornell Vet.* **32.** 289–294. **304**

An examination was made of milk from cows free from udder infection other than *Br. abortus*. When the numbers of brucella organisms in milk were low, *i.e.* less than 100 organisms per ml. of cream, the changes in the milk were slight or absent. Where the brucella count was high, changes occurred in the milk. In an infected quarter cell counts (leucocyte) of strippings were higher than those of the fore milk, but were approximately the same in uninfected quarters. In a highly infected quarter, lesions occurred primarily in the interalveolar connective tissue. They consisted of focal areas with marked infiltration with mononuclear and polynuclear leucocytes. Some proliferation of the alveolar epithelium in the inflammatory areas was observed. There was also proliferation of the interalveolar and interlobular connective tissue.—S. J. G.

HAUPT, H. (1942). Der Einfluss des Wasserstoff-Ionen-Dichte von Bakterienaufschwemmungen auf das Ergebnis der Agglutination mit Brucella abortus. [**Influence of pH of Bacterial Suspensions Used in Agglutination Tests for *Br. abortus***].—*Berl. Münch. tierärztl. Wschr.* June 12th. 181–182. **305**

H. stresses the importance of the pH of the bacterial suspension used in aggln. tests for *Br. abortus*. The optimum concentration is pH 6 to 7·5, suspensions with a pH of more than 8 being unreliable. He recommends that suspensions be made up in a buffered solution.—J. CSONKA.

SEELEMANN, M. (1942). Welche Unterschiede bestehen zwischen dem amerikanischen und dem deutschen Abortus-Bang-Immunisierungsverfahren? [**Differences between American and German Methods of Immunization against Bovine Brucellosis**].—*Berl. Münch. tierärztl. Wschr.* July 10th. 212-215. **306**

The position in Germany is as follows. In 1935 the use of live brucella cultures was altogether prohibited. In 1941 this order was relaxed to permit live virulent culture of local origin to be used on calves up to 12 months old in heavily infected herds in Schleswig-Holstein only. Later in 1941 the use throughout the rest of Germany of bile culture (*Behringwerke*) of low virulence was allowed in heavily as well as in newly infected herds. The use of this bile culture was permitted in heifers and nonpregnant cows. The bile culture has been found by S. to be somewhat less virulent than the American strain 19.

G. reviews the American experiences with the latter and also mentions MCEWEN'S strain 45 and concludes that the use of such strains is advisable in the control of brucellosis.

The chief problem to be resolved in Germany is the advisability of using live virulent culture on animals as old as 12 months.—J. E.

BESSONOV, D. K. (1941). Vaktsinatsiya pri brutselleze. Soobshchenie 1. [**Vaccination against Brucellosis with Formol-Saponin Vaccines. I**].—*Veterinariya, Moscow.* No. 2. pp. 3–6. [French summary]. **307**

The immunological properties of two types of vaccine were tested in g. pigs, three inoculations being given at intervals of 10–12 days followed 30–35 days later by the injection of virulent culture. One vaccine was prepared as a suspension of killed virulent cultures (strain B-14) and live avirulent cultures (B-9), the other was a formol-saponin vaccine, prepared from strain B-14 to which 0·2% agar was added. Immunity was tested a month later by P.M. and bacteriological examination of the lymph nodes, bone marrow, liver, spleen, heart blood and urine. In 16 out of 20 g. pigs inoculated with the vaccine of mixed killed and avirulent live bacilli and in all the eight g. pigs vaccinated with formol-saponin vaccine, bacteriological examination of the organs was negative, whereas all control g. pigs contracted infection.

It was found that brucella suspended in a mixture composed of 25% lanolin, 74·5% liquid paraffin, and 0·5% lycopodium remained alive in the incubator over 30 days.—A. MOLDAWSKY.

STEARNS, T. W., & ROEPKE, M. H. (1941). **The Effect of Dissociation on the Electrophoretic Mobility of Brucella.**—*J. Bact.* **42.** 745–755. **308**

Electrophoretic measurements by the microscopic

technique on strains of *Br. abortus* show that mucodi dissociated forms have a greater mobility than the S form from which they are derived, the increase in mobility being greater the longer the passage in broth. Dissociated forms having appreciably different mobilities can be separated by colony appearance.

Passage of dissociated forms of *Br. abortus* of high mobility through g. pigs resulted in a decrease in mobility but there was no change in their antigenic properties. The dissociated forms were still appreciably different in mobility from the original S strain.

—R. A. KEKWICK.

See also absts. **377, 471** (Brucellosis).

MUROMTSEV, S. N. (1940). Analiz meropriyatiĭ po likvidatsii emfizematoznovo karbunkula rogatovo skota. [**Eradication of Blackleg in Cattle**].—*Sovyet. Vet.* No. 4. pp. 28–30. **309**

Recommendations of a general character regarding measures for the eradication of blackleg, including vaccination and veterinary control of pastures and watering facilities.

HARSHFIELD, G. S., CROSS, F., & HOERLEIN, A. B. (1942). **Further Studies on Overeating (Enterotoxaemia) of Feedlot Lambs.**—*Amer. J. vet. Res.* **3.** 86–91. **310**

In a continuation of previous studies [see NEWSOM & THORP—*V. B.* **9.** 151.], filtrates from the intestinal contents of "overeating cases" were injected intravenously into rabbits: 31 were found to be toxic. Of 30 filtrates prepared from cases other than those diagnosed as due to overeating, two only were toxic.

A marked activation of toxin was produced by the addition of pancreatin or of normal lamb intestinal filtrate to the Seitz filtrate of cultures of *Clostridium welchii* isolated from overeating cases; the increase in potency was not, however, as great as that reported by BOSWORTH & GLOVER. During these tests, it was found that a marked hyperglycaemia was produced in the experimental rabbits and lambs inoculated intravenously with active material. Hyperglycaemia was likewise detected in a number of field cases.

The enterotoxaemia syndrome was reproduced in three out of eight lambs which were fed with cultures of *Cl. welchii*, together with large amounts of either grain or milk [see ROBERTS—*V. B.* **9.** 75]. The injection of either toxic intestinal filtrates or of culture toxins directly into the intestines of laporotomized lambs was, however, without harmful effect.—A. N. W.

*FRENKEL, G. M. (1940). [**Atoxic Strains of** *Clostridium botulinum*].—*Zh. Mikrobiol., Moscow.* No. 7. 73–92. [In Ukranian: Russian and English summaries]. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 75]. **311**

Atoxic strains of *Cl. botulinum* are not, as supposed by HADLEY, *sporogenes*-like "dissociative forms". In experiments with *Cl. botulinum-Cl. sporogenes* associations, *Cl. botulinum* was displaced by *Cl. sporogenes*, toxicity disappeared and the association finally became characteristic of *Cl. sporogenes*. Atoxic strains isolated from canned vegetables proved to be *Cl. botulinum-Cl. sporogenes* associations; in those few cases where *Cl. botulinum* was predominant, weak toxicity was observed; in other cases, however, the strains were completely atoxic. Cultivation *in vitro* for 3–4 years showed that all strains assumed the characteristics of *Cl. sporogenes* and thus became atoxic. Food from cans containing *Cl. botulinum* is unfit for human consumption, and food from cans with *Cl. botulinum-Cl. sporogenes* associations can only be safely consumed under certain conditions.—E. R. PARISER.

See also absts. **439, 440** (Clostridium infection).

KLIENEBERGER, E., & SMILES, J. (1942). **Some New Observations on the Developmental Cycle of the Organism of Bovine Pleuropneumonia and Related Microbes.**—*J. Hyg., Camb.* **42.** 110–123. **312**

Pleuro-pneumonia organisms were grown under a coverslip, on solid and semi-solid agar, and fixed *in situ* by allowing Bouin's solution to diffuse through the medium. After removal of the medium, the resulting impression preparation was stained in Giemsa's solution, washed, dehydrated, differentiated, and mounted in neutral Canada balsam, without being allowed to dry during the process.

The microscopic method of annular oblique incident illumination was applied to the study of living pleuro-pneumonia cultures. The organisms were grown under a coverslip on a layer of medium 0·2 cm. thick, containing naphthalene blue-black in a concentration of 1 : 2,000 for the purpose of eliminating reflection from the medium when cultures were examined by dark-ground illumination.

Examination of the above preparations showed that pleuro-pneumonia organisms multiply in two ways, first by segmentation and then by the formation of granules or elementary corpuscles within elements possessing limiting membranes. The elementary corpuscles are the ultimate reproductive units and are small enough to be filtrable. The actual process of granule formation appeared to be preceded by a concentration of the protoplasm, followed by the formation of a membrane and the appearance of structures suggesting the presence of a nuclear apparatus. Filamentous forms were found to be the result of external forces and influences on the soft-growing protoplasm, and did not seem to be a necessary phase of the life-cycle.

Examples of the different growth phases are illustrated by photomicrographs of stained and living specimens, and by diagrams, of pleuro-pneumonia and related organisms.—ISOBEL W. BURTON.

WARREN, J. (1942). **Observations on some Biologica Characteristics of Organisms of the Pleuropneumonia Group.**—*J. Bact.* **43.** 211–228. **313**

This is a study of some metabolic characters of the organism of contagious agalactia, bovine contagious pleuro-pneumonia, and of *Asterococcus canis*, *Streptobacillus moniliformis* (*A. muris*), and the L_1, L_3, L_4, and L_5 organisms. First the effect of CO_2 concentration on growth was investigated. All except the organisms of contagious agalactia and bovine contagious pleuro-pneumonia tolerated 10% CO_2. The growth of *Streptobacillus moniliformis* and the L_1 organism was enhanced by this concentration, and they were able to grow in 20% CO_2. None of the organisms tolerated 30% CO_2. The carbohydrate reactions of all except *A. canis* were determined. Gas was never produced. All strains fermented glucose and none fermented inulin or salicin. All except the L_3, L_4, and L_5 organisms split lactose; the organism of contagious agalactia alone split sucrose. A lactic dehydrogenase was present in every case.

The strains could be divided into three types in respect of time-potential curves. *Streptobacillus moniliformis* and the L_1 organism belonged to one type; the L_3, L_4, and L_5 organisms formed a second group and the organisms of bovine contagious pleuro-pneumonia and contagious agalactia a third.

The organism of bovine contagious pleuro-pneumonia was the only one which produced lysin for rabbit erythrocytes. The L_3 organism occasionally produced a green discoloration on sheep-blood bovine-serum agar.

All except *A. canis* and the L_5 organism were tested for exotoxin, with negative results. The comparatively

rapid loss of virulence of *Streptobacillus moniliformis* and the L_4 organism was associated with the disappearance of a reductase for some component of serum broth. The sensitivity of the various strains to hydrogen peroxide, phenol, and ultra-violet light resembled that of the larger bacterial species.—Isobel W. Burton.

Sabin, A. B. (1942). **The Filtrable Microörganisms of the Pleuropneumonia Group. (Appendix to Section on Classification and Nomenclature).**—*Bact. Rev.* **5.** 331–335. **314**

S. discusses some criticisms of his suggestions for the classification and nomenclature of the organisms of the pleuro-pneumonia group [see *V. B.* **11.** 762.], and gives a reconstructed classification as follows. Class Paramycetes, Order Anulomycetales, with two families, (1) Anulomycetaceae, with the following genera (type species given in brackets) :– *Anulomyces* (*A. agalaxiae*), *Asterococcus* (*A. mycoides*), *Canomyces* (*C. canis*), *Murimyces* (*M. pulmonis*), *Musculomyces* (*M. neurolyticus*); (2) Sapromycetaceae, with the genus *Sapromyces* (*S. laidlawi*).—Isobel W. Burton.

Poole, E. A., & Hinshelwood, C. N. (1940). **Physico-chemical Aspects of Bacterial Growth. Part VI. The Influence of Toxic Substances on Growth Rate, Stationary Population, and Fermentation Reactions of *Bact. lactis aerogenes*. Part VII. Influence of Phenol on the Death Rate of *Bact. lactis aerogenes*.**—*J. chem. Soc.* Pt. II. 1565–1572 and 1573–1574. **315**

VI. The influence was investigated of phenol, mercuric chloride, formaldehyde and copper sulphate upon the growth and activity of *Bact. lactis aerogenes*. Curves of varying types, ranging from linear to one showing an abrupt drop to zero at a critical concentration, were obtained by plotting growth or gas evolution against concentration of toxic substance. An analysis of these results appears to suggest four distinct effects of the toxic substance :– (1) an increase in the lag phase before cell division, (2) a slowing up of the actual processes of cell division, (3) an effect on the metabolic reactions which go on even when active division has ceased, and (4) an acceleration of the lethal processes causing cell death.

VII. The influence of phenol on the death rate of *Bact. lactis aerogenes* was measurably less than its influence on the division rate. Viable counts appear to confirm that the "stationary phase" is not due to a simple balancing of death rate and division rate, but depends on an actual cessation of division.

—J. Lochiel McGirr.

See also absts. **435, 436, 470, 477** (Metabolism of Micro-Organisms), **490** (Text-Book).

DISEASES CAUSED BY PROTOZOAN PARASITES

*Biocca, E. (1941). Infezione sperimentale di embrioni di mammiferi con Trypanosoma brucei. **[Experimental Infection of the Mammalian Embryo by *T. brucei*].**—*Ann. Igiene (sper.).* **51.** 157–159. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 108]. **316**

The use of mammalian embryos is proposed for experimental infection with protozoa. The technique used and the results so far achieved with g. pig embryos infected with *T. brucei* are described.—E. R. Pariser.

van Hoof, L., Henrard, C., & Peel, E. (1940). Recherches sur le comportement du "Trypanosoma gambiense" chez le porc. **[Research on the Behaviour of *T. gambiense* in the Pig].**—*Ann. Soc. belge Méd. trop.* **20.** 203–226. [Flemish summary]. **317**

In continuation of work previously reported [*V. B.* **8.** 633 and 634] the authors describe further observations on *T. gambiense* infection in swine. The strain of human origin has now been passaged cyclically by tsetse transmission through 11 pigs in about two years and then passed back to man, in which it caused a normal infective reaction, *i.e.* it had not lost virulence in the porcine hosts. During the pig passages the "transmissibility index" by tsetse fell gradually until the seventh passage, and then rose again but to a lower level than originally, indicating a concomitant variation in density of infection of the pigs' blood. Records are given of numbers of flies fed, numbers found to be infected, and numbers infected in their salivary glands, all at varying periods after infection of the pig hosts. The transmissibility index was highest between the 100th and 185th days of infection in the pig, falling thereafter.

A table gives data on blood infection in the pigs at various times after infection, which was always benign. Only a few of the pigs regularly yielded a positive blood smear, most of them showing trypanosomes in small numbers now and then for periods varying between 100 and about 400 days. It was found that pigs which had thrown off infection could readily be reinfected with the same or other strains.

The trypanosome strain used was found to acquire resistance to tryparsamide in g. pigs.

It is concluded that pigs can act as a reservoir of *T. gambiense*, but are less important in this respect than human beings. Whether pigs act as reservoirs under natural conditions is not known.—J. E.

van Hoof, L., Henrard, C., & Peel, E. (1940). Irrégularités de la transmission du "Trypanosoma gambiense" par "G. palpalis". **[Irregularities in Transmission of *T. gambiense* by *Glossina palpalis*].**—*Ann. Soc. belge Méd. trop.* **20.** 227–243. [Flemish summary]. **318**

Generally a single "bite" by an infected tsetse fly suffices to set up infection in the susceptible host, but occasionally no infection is produced. Failure of infection occurred in 7·7% of the authors' experiments.

Theories to account for this are put forward, and observations made thereon during transmission experiments are described. The main theories to account for failure in transmission by infected flies are :– (1) that the host is refractory, (2) that the trypanosome is at the time non-virulent, and (3) that the fly is in some way responsible. It was commonly found that the same fly infected some, but not all, of a series of g. pigs and often that a g. pig which did not become infected on one occasion was easily infected on another, thus tending to invalidate theories (1) and (3). The second theory might be supported by the assumption that previous drug treatment of the source host had rendered its parasites avirulent. In practice, however, this would have meant that the drug (usually Bayer 205) had acted for as long as 300 days after administration—a very unlikely assumption. Delay in the cyclical development of the trypanosomes in the tsetse flies might explain some cases of failure in transmission but could not account for all.

The problem still remains largely unsolved.—J. E.

*Roubaud, E., & Provost, A. (1941). Propriété protectrice non spécifique du sérum dans les infections à Tr. cazalboui (souche des Antilles). **[Non-Specific Protective Property of the Serum in Infections by *T. vivax* (Antilles Strain)].**—*Bull. Soc. Path. exot.* **34.** 124–126. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 109]. **319**

A protective mechanism against *T. brucei*, of a

strain virulent for mice, could be observed in the serum of goats carrying a long-standing chronic infection with an Antilles strain of *T. vivax*. This protection is only active for *T. brucei* at the limits of its vitality, after a long period in the incubator in contact with the serum *in vitro*: *T. brucei* which has been subjected for a long time to the action of this heterologous protective serum either does not infect mice or does so with a marked delay.—E. R. PARISER.

POLKANOV, N. N., & AGADZHANOV, I. A. (1941). Opyt kul'tivirovaniya Trypanosoma equiperdum v testikulakh krolikov. **[Cultivation of *T. equiperdum* in Rabbit Testicle].**—*Veterinariya, Moscow.* No. 2. pp. 92–96. [French summary]. 320

The authors inoculated rabbits intratesticularly with material from genital lesions and parenchymatous organs of horses naturally infected with a highly virulent local strain of *T. equiperdum*. A rich culture of the organism was produced. Vaginal secretion of an infected mare, inoculated on to the conjunctiva of a healthy mare, set up a conjunctivitis.—E. R. PARISER.

REICHENOW, E. (1940). Zur Fage der Bedeutung des Blepharoplasts der Trypanosomen. **[Significance of the Blepharoplast of Trypanosomes].**—*Arq. Inst. biol., S. Paulo.* **11.** 433–436. 321

Attention is drawn to the fact that the absence of a blepharoplast is most marked in *Trypanosoma equinum*, *T. venezuelense* and *T. evansi*, all of which are species which do not undergo cyclical development in insects. It appears that the absence of a blepharoplast in these species does not affect their ability to survive in the mammalian host, nor are strains of trypanosomes adversely affected in this respect when rendered ablepharoplastic by treatment of the host. It is, therefore, suggested that the function of the blepharoplast is probably connected with development in the intermediate host. It is pointed out that *T. congolense* and *T. vivax*, in which the blepharoplast is regularly present, develop in tsetse flies more readily than does *T. brucei* in which ablepharoplastic forms are more common.

On the assumption that development in culture corresponds with development in insects, an attempt was made to render ablepharoplastic a strain of *T. gambiense*, and to test its ability to survive in culture. It proved impossible to produce a strain with more than 70% of ablepharoplastic individuals, and this strain developed as readily in culture as did normal strains: only individuals with blepharoplasts appeared in the cultures.

—U. F. RICHARDSON.

SUDACHENKOV, V. V. (1941). Opyty po perenosu babezielloza (Babesiella bovis—Babes, 1888) krupnogo rogatogo skota kleshchami Ix. ricinus L. i Ix. persulcatus P. Sch. **[Transmission of Bovine Babesiasis by *Ixodes* spp.].**—*Veterinariya, Moscow.* No. 2. pp. 75–85. [French summary]. 322

Experiments on the transmission of *Babesia bovis* infection by *I. ricinus* showed that, in certain cases, cattle can be infected by larvae which are the progeny of infected female ticks. It was found, however, that not all larvae from one and the same population of ticks, nor the progeny of all females experimentally infected, are capable of transmitting the disease. Some nymphs which had developed from infected populations were found to be capable of transmitting the disease, and it was shown that adult ticks were infective. It was also established that temperature and humidity have no great influence on the development of the piroplasm in the ticks. The quantity of piroplasms taken in by the ticks during the time of acute illness of the host animal does not influence transmission of the infection to the daughter ticks. Ticks collected from cattle a few months after infection can only transmit infection to their progeny to a very limited extent. The stage of development of the tick as well as the physiological condition of the digestive apparatus at the moment of blood intake, has an important influence on the infection of the offspring.

It is clear that neither *I. persulcatus* nor *I. ricinus* is capable of being infected in the larval or nymph stage.

—E. R. PARISER.

ABRAMOV, I. V. (1940). O dlitel'nosti virusonositel'stva pri piroplazmozakh.—**[Duration of the Infective Period in Piroplasmosis].**—*Sovyet. Vet.* No. 1. pp. 33–34. 323

A number of animals which had recovered from artificial piroplasmosis set up by inoculation or by placing infected ticks on them, were kept under observation for some years. After the animals had recovered from the reaction to infection, biological tests were made periodically to ascertain whether infection persisted; blood smears were examined at intervals for parasites.

Babesia bigemina persisted for 15 months. *B. caballi* persisted for 41 months. *B. equi* persisted for 5½ years. *B. trautmani* persisted for eight months after recovery.

Experiments with *Babesiella*, *Françaiella* and *B. ovis* in sheep are referred to; no parasites could be demonstrated after 22 months and after 26 months the animals were proved to be susceptible to infection. [Details given are insufficient.]

WAGNER, O. (1941). Experimentelle Untersuchungen über Ostküstenfieber an einheimischen Rindern. **[Research on East Coast Fever in Cattle in Germany].**—*Dtsch. tropenmed. Z.* **45.** 97–102. 324

In an attempt to explore the possibilities of chemotherapy in E.C.F., three calves in Germany were infected by exposure to nymphs of *Rhipicephalus appendiculatus* raised from larvae which had fed on an infected animal in South Africa. Within a few days of infection there was a swelling of the lymph nodes, and blue bodies appeared in the l.nn. in 5, 10, and 13 days respectively, whilst the intra-erythrocyte stages appeared between the 15th and 17th days. Loss of appetite was first noticed on the 9th day and the temperature rose between the 9th and 14th days, but fell again in the third week of infection, at the end of which the animals died. An early leucocytosis was followed by leucopenia with a marked decrease in the number of eosinophiles. The number of erythrocytes decreased during the second half of the infection, and in the last week the haemoglobin content of the blood decreased by 50–39%.

Nymphs raised from infected larvae were found to be infective after being starved for six months, but not after 12 months, and it was found possible to keep them alive without feeding for nearly 15 months. The males were said to suck blood but moved their place of attachment on the host. Larvae and nymphs sucked blood for 5–8 days, and adults for 8–12 days. Engorged females commenced to lay eggs 3–5 days after falling from the host, and at temperatures of 28°–30°C. and a humidity of 50%, larvae commenced to appear in 25–28 days.

No drug of value in treatment was encountered, and no information is given as to the drugs tested.

—U. F. RICHARDSON.

REICHENOW, E. (1940). Der Entwicklungsgang des Küstenfiebererregers im Rinde und in der übertragenden Zecke. **[Life-Cycle of *Theileria parva* in Cattle and in the Transmitting Tick].**—*Arch. Protistenk.* **94.** 1–56. 325

R. states that in cattle he has been able to detect multiplication of *T. parva* only in lymphocytes.

Although the parasites may enter monocytes, erythrocytes, and endothelial cells no multiplication occurs in these cells. He considers that multiplication is entirely by binary fission and does not accept the theory that schizogony occurs with the formation of agamonts and gamonts. He points out that there are three types of blue bodies, containing large, intermediate, and small chromatin granules, and considers that these are produced in the course of multiplication, with a reduction of the chromatin from that shown in the so-called "agamont" type through the intermediate type to the final stage with its fine granules. He points out that the organisms released when the host cell is destroyed all belong to one type, and show no differentiation into organisms with large and small nuclei. The parasites penetrate the erythrocytes when they are released in the bloodstream, but they do not multiply in these cells. Early invading forms consist principally of nuclear material, and in the erythrocytes these develop to rod- and comma-shaped forms and finally to oval and round forms, the latter representing the commencement of degeneration.

In the tick the parasites are freed from the erythrocytes and congregate into masses, but R. considers that this congregation is due to the digestive processes in the tick's intestine and represents an early stage of degeneration, and is not a congregation due to a sexual process as has been suggested. It appears that the vast majority of parasites are destroyed in the gut of the tick, but that a few succeed in penetrating the gut wall. Where these penetrating organisms proceed has not been determined, but under the stimulus provided when the tick commences to suck they appear in the salivary glands and multiply there by binary fission. R. was unable to confirm the occurrence of a motile oökinete as described by COWDRY & HAM, and suggests that these authors were describing a new parasite of ticks. The various symbionts, cell inclusions, and degenerative changes of cells encountered in tick examination are described, and the question whether piroplasms are originally parasites of mammals or of insects is discussed.

—U. F. RICHARDSON.

LERNER, & WOJTEK. (1942). **Hühnerspirochätose. [Avian Spirochaetosis].**—*Dtsch. tierärztl. Wschr.* **50.** 364–365. **326**

An outbreak of disease in fowls in southern Poland, in which 22 birds out of 74 died within five days, is ascribed to spirochaetosis on the finding of spirochaetes in the blood of a hen sent in for examination. After the first outbreak, four other birds with spirochaetal infections were received. In the examinations, dark-ground illumination and Giemsa staining of specimens were adopted, but it is pointed out that the spirochaetes may disappear rapidly from the blood after death, and that this may account for failures to demonstrate the organisms.

The pathology of the disease is said to be typical of a septicaemia and to resemble that of fowl plague, the characteristic lesions of spirochaetosis being a bluish discoloration of the comb and wattles, brittleness of the liver, a bluish discoloration of the spleen and lymph nodes, purple punctiform depressions in the glandular stomach, and a green-brown discoloration of the peritoneal fat.

The disease is said to break out in the coldest part of the year, and to spread whilst cool weather lasts. [It seems doubtful whether the authors were not dealing with outbreaks of fowl plague complicated by an enzootic spirochaetosis.]—U. F. RICHARDSON.

See also absts. **441**, **483**, **500** (Trypanosomiasis), **476** (Trichomoniasis), **475** (Amoeba and other Protozoa), **442**, **443** (Coccidiosis), **444** (Malaria), **356** (Protozoa of Cattle).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

RICHTER. (1942). **Erfahrungen in der Bekämpfung der Maul- und Klauenseuche in Schlesien. [Experiences in the Control of Foot and Mouth Disease in Silesia].**—*Berl. Münch. tierärztl. Wschr.* April 3rd. 97–101. [Also appeared in *Dtsch. tierärztl. Wschr.* **50.** 134–135]. **327**

A general discussion on F. & M. disease and its control in Germany, with some experiences in Silesia. R. calculates that from 1938–42 the total monetary loss from cattle which had died as a direct result of the disease in Germany was 67 million RM. The indirect loss, from secondary mastitis, foot injury, myositis, heart failure, etc. was probably much more, but was impossible to estimate. In Silesia (Government district Breslau), 4,484 cows worth RM. 1,775,000 died as well as sheep, goats, and swine worth RM. 120,000.

The Riems vaccine was used in four districts of Silesia in 1938 and was considered to have been very successful in immunizing about 40,000 cattle during the severe outbreak in that year.

The question of transmitting agents is discussed. One outbreak was probably due to the movements of crows, although birds are not considered to be capable of carrying infection over long distances. Human beings are the principal carriers of infection from farm to farm.

—J. E.

FORSSMAN, J., & MAGNUSSON, H. (1942). **In welchem Ausmass sind von der Maul- und Klauenseuche genesene Tiere Ansteckungsträger? [To what Extent are Animals Recovered from Foot and Mouth Disease Carriers?]**—*Z. InfektKr. Haustiere.* **58.** 209–225. **328**

A critical review of the literature. The amount of experimental work on the question of carriers of F. & M. virus is limited; WALDMANN *et al.* (1931) found that virus was rarely to be found in infected animals later than 24 days after infection, except when special enrichment methods were used. The English Foot and Mouth Disease Research Committee [see *V. B.* **8.** 144.] obtained negative results in virus carrier experiments.

Various reporters have claimed to have found evidence of virus carriers as causes of outbreaks. JERLOV [*V. B.* **10.** 668.] and FLÜCKIGER [*V. B.* **9.** 82 and **10.** 506.] both incriminated them, but MOHLER *et al.* (1928) found no evidence that cattle become carriers. The present authors criticize the conclusions of JERLOV and FLÜCKIGER and believe that the outbreaks on which they based their conclusions could have arisen in other ways.

[This article in German is a report with a few additions of one published in Swedish in 1939—see *V. B.* **10.** 668. The authors curiously fail to refer to JERLOV's latest and complete account of the Swedish epizootic of 1938–40, in which he gives what he considers to be fresh circumstantial evidence of virus carriage over long intervals [see *V. B.* **11.** 513].—J. E.

See also abst. **487** (Foot and Mouth Disease).

BAILEY, G. H., & GARDNER, R. E. (1942). **Anaphylactogenic Properties of Normal and Virus-Infected Brains, with Special Reference to Neurokeratin.**—*Amer. J. Hyg.* **36.** 205–215. **329**

A tissue-specific, water-soluble anaphylactogen probably derived from neurokeratin, was obtained from heated aqueous extracts of brain, particularly the white matter. Its presence was detected by anaphylactogenic tests with passively sensitized g. pigs.

This substance was digestible by trypsin but not by pepsin and was practically free from lipoids. No significant differences were detected in the anaphylactogenic properties of the central nervous system from various normal animals (ox, sheep, goat, dog, cat, rabbit, and rat) or from animals infected with various neurotropic viruses. In the g. pig, however, some differences were noted between normal animals and those infected with rabies or equine encephalomyelitis.—R. E. Glover.

Schaaf, J. (1941). Über die Feststellung der Tollwut durch Laboratoriumsmethoden. [**Laboratory Diagnosis of Rabies**].—*Tierärztl. Rdsch.* **47.** 607–610. **330**

Rabies is the most important animal disease in the *Generalgouvernement* of Poland, so the German veterinary authorities decided to provide diagnostic facilities for all known or suspected cases of rabies in animals. Since 1940 this work has been done in veterinary institutes at Warsaw, Krakow, and Pulawy and three methods have been adopted :– (1) microscopic examination of preparations of hippocampus tissue by a thick smear method, stained by a mixture of carbol fuchsin and methylene blue as described by Gerlach ; (2) the examination of histological sections stained by Lentz's method or by the dyes used in (1) but in different proportion, and (3) rabbit inoculation. Method (1) was found to be at least equal in reliability to (2) and is much more rapid, whilst (3) is used only in cases negative to methods (1) and (2). In practice methods (2) and (3) are used only when methods (1) or (2) respectively have been negative.

Results are given of work at Krakow and Pulawy 590 (80% of 740) brains from 553 dogs, 38 horses, 109 cattle, 31 cats, and 9 pigs were judged positive for rabies and 545 were so diagnosed by methods (1) or (1) + (2), leaving only 45 cases to be found by the rabbit test. Negri bodies were found present in almost every rabid dog and cat, but only in 78–83% of the rabid horses, cattle and pigs. Delayed positive results with the rabbit test are mentioned, the development of the rabies syndrome not occurring for four, six, and seven months. —J. E.

*Lépine, P., & Sautter, V. (1941). Constance de la taille du virus rabique appréciée par l'ultrafiltration. [**Constancy in Size of Rabies Virus as Estimated by Ultrafiltration**].—*C. R. Soc. Biol. Paris.* **135.** 1089. [Abst. from abst. in *Bull. Inst. Pasteur.* **40.** 167]. **331**

The size of the virus of two rabies virus strains, one fixed and the other not fixed was found by the ultrafiltration method to be 120–160 mμ. The size estimated for the Paris fixed virus falls within this range. The authors suggest that variation in virus particle size as reported by others may correspond to varied virulence.

Noury, M. (1942). Sur le comportement du virus rabique fixe utilisé à Casablanca. [**Behaviour of Fixed Rabies Virus used at Casablanca**].—*Bull. Soc. Path. exot.* **35.** 244–247. **332**

The fixed virus strain received at Casablanca in 1934 from the Institut Pasteur, Paris, has been tested and found to have retained its original qualities regarding resistance to desiccation and to glycerin. Results are described of virulence tests on rabbits with virus desiccated from 2–6 days and virus kept in glycerin from 2–20 days.—J. E.

Wyssmann, E. (1942). Nochmals zur Frage des Vorkommens der Aujeszky'schen Krankheit (Pseudowut) in der Schweiz. [**On the Question of the Existence of Aujeszky's Disease in Switzerland**].—*Schweiz. Arch. Tierheilk.* **84.** 32–34. **333**

In connexion with the suggestion made in a previous paper [see *V. B.* **12.** 224] that Aujeszky's disease may occur in Switzerland, W. draws attention to a report of what seems to have been cases of this disease described by Strebel (1889) in Freiburg canton. —J. E.

I. Selter, H. (1941). Zur Arbeit von Herzberg und Gross : "Untersuchungen über Influenza.—II. Mitteilung. Isolierung eines filtrierbaren Pneumonieerregers durch den Mäuseversuch". Dieses Z bl. I Orig., 146. Band, S. 129. [**Comment on the paper by Herzberg and Gross entitled "Research on Influenza. II. Isolation of a Filtrable Agent through Mice"** (*V. B.* **12.** 447)].—*Zbl. Bakt. I.* (*Orig.*). **146.** 351–352. **334**

II. Beller, K. (1941). Zu der Bemerkung von Prof. Dr. H. Selter. Dieses Zbl. I Orig., 146. Band, S.351. [**Reply to Article by Selter on Infectious Catarrh of the Respiratory Tract of Horses**].—*Ibid.* **147.** 33–35. **335**

I. This is not a commentary on the quoted article, but just a reminiscence inspired by the article on the subject of a serious disease in horses in Flanders in 1915, which appears to have been one of the influenza group. S.'s main point is that he regarded it then as caused fundamentally by a filtrable virus.

II. B. agrees with Selter and states that the equine disease observed in Flanders in 1915 was Brussels disease which is undoubtedly the same as what is now called *Ansteckende Katarrh* [Beller & Traub—*V. B.* **12.** 374]. B. differentiates this disease from *Rotlaufseuche* [probably "pink eye"] by the fact that while both are primarily virus-caused, the former is associated also with streptococcal infection and the latter with salmonella, especially *S. abortus-equi.* B. further appears to doubt whether *Ansteckende Katarrh* is identical with Hoppegarten cough.

B. finally postulates the existence of viruses, which may be only slightly pathogenic *per se*, in many animal diseases including strangles [see *V. B.* **12.** 580].—J. E.

Cohrs, P. (1941). Die infektiösen Katarrhe der Atmungsorgane des Pferdes. (Ergebnisse der neueren Forschung). [**Infectious Respiratory Catarrh of the Horse. Review of Recent Research**].—*Berl. Münch. tierärztl. Wschr.* May 2nd. 218–220. **336**

C. discusses the literature of about 1925 onwards on respiratory diseases of the horse, with the object of clarifying their identity. He concludes by naming three diseases (excluding strangles) as follows :– (1) infectious bronchitis (laryingotracheo-bronchitis contagiosa equorum, *ansteckender Katarrh der Luftwege, seuchenhafte Husten, Hoppegartener Husten, epizootischer Kehlkopf-Luftröhrenkatarrh*, Skalma) a virus disease ; (2) infectious broncho-pneumonia (Brussels disease), a complication of (1), and (3) *Brustseuche* (pleuro-pneumonia contagiosa equorum) the causation of which is unknown.

[In future the name "equine infectious bronchitis" will be used for (1) in the *Vet. Bull.*]—J. E.

Smorodintsev, A. A., & Shishkina, O. I. (1940). [**The Mechanism of Acquired and Natural Immunity against Influenza. I. The Role of the Humoral Factor in the Mechanism of Active Immunity against Influenza. II. The Role of the Phagocytic Apparatus of Actively Immunized Animals in the Struggle against the Infection**].—*Arch. Sci. Biol.* **59.** No. 1/2. 3–19 and 20–37. [In Russian : abst. from English summaries]. **337**

The work summarized indicates the high importance of humoral antibodies and the low value of phagocytic cells in the genesis of immunity against influenza.

Cilli, V. (1939). Anemia infettiva degli asini ed anemia perniciosa dell'uomo. [**Infectious Anaemia**

in the Ass and Pernicious Anaemia in Human Beings].—*IV Congr. int. Pat. comp., 1939.* **2.** 169–173. [In Italian]. 338

A study of the clinical, pathological, and haematological characteristics of infectious anaemia in the ass, compared with human pernicious anaemia.

HAMMON, W. McD., LUNDY, H. W., GRAY, J. A., EVANS, F. C., BANG, F., & IZUMI, E. M. (1942). **A Large-Scale Serum-Neutralization Survey of Certain Vertebrates as Part of an Epidemiological Study of Encephalitis of the Western Equine and St. Louis Types.**—*J. Immunol.* **44.** 75–86. 339

In order to determine the species of animals which may act as vertebrate reservoirs for St. Louis and equine encephalomyelitis viruses, sera were obtained, (a) from the Yakima Valley, Washington, where numerous human and equine cases have been detected, and (b) from an area relatively free from the disease. The serum-virus intracerebral test in mice was employed.

In the infected area, 566 sera were collected from 74 species, 284 from birds and 282 from mammals: 132 samples were secured from the clean area. In the Yakima district, the sera of approximately 50% of domestic birds were positive whereas in wild birds the figures were 22% for St. Louis and 17% for encephalitis. The percentage of mammalian sera was lower with a significantly higher proportion in the domestic species. There were no positive feline samples. In the control area one duck serum neutralized St. Louis virus: the remainder were negative.

Assuming that the presence of neutralizing antibodies is an index of infection, these results seem to show that many species of birds and mammals may serve as reservoirs for the infection of mosquitoes.

—R. E. GLOVER.

TAYLOR, A. R., SHARP, D. G., & BEARD, J. W. (1940). **Influence of pH on the Molecular Stability of the Equine Encephalomyelitis Virus Protein (Eastern Strain).**—*J. infect. Dis.* **67.** 59–66. 340

Examination of E.E. virus protein in the ultracentrifuge with the light-absorption method shows that its sedimentation constant remains unchanged at $s_{20} = 250 \times 10^{-13}$ in buffer-Ringer solutions over the pH range 7·0–10·5. Above pH 10·5 the sedimentation constant decreases rapidly.

The protein is not entirely stable between pH 7·0–10·5 since non-centrifugible light-absorbing material is formed at a rate increasing with the pH. The material is insoluble between pH 6·0 and 1·6.

Previous experiments have shown that the protein is infective in the pH range 7·0–8·5, which corresponds to a region of maximal molecular stability.—R. A. K.

I. SMITHBURN K. C. (1942). **Differentiation of the West Nile Virus from the Viruses of St. Louis and Japanese B Encephalitis.**—*J. Immunol.* **44.** 25–31. 341

II. SMITHBURN, K. C., & JACOBS, H. R. (1942). **Neutralization-Tests against Neurotropic Viruses with Sera Collected in Central Africa.**—*Ibid.* 9–23. 342

I. A filtrable neurotropic virus isolated from the blood of an African native in the West Nile area was compared with St. Louis and the Japanese B encephalitis viruses using (a) the intracerebral inoculation of mice with immune serum-virus mixtures, and (b) cross-vaccination tests in mice.

It was found that the antibody against the West Nile (W.N. virus) was ineffectual against the other two. St. Louis antiserum gave a strong neutralization of W.N. virus but none against Japanese B, while Japanese B antiserum was negative against W.N. virus and partially effective against St. Louis. Mice vaccinated with St. Louis or Japanese B virus and resistant to the homologous strains were susceptible to W.N. virus: conversely, mice protected against W.N. were not immune to St. Louis or Japanese B.

The results show a separate immunological identity of the three viruses and indicate that Japanese B is antigenically the most complex.

II. A series survey of sera from human beings in the Northern area of Africa showed that antibodies were developed against W.N. virus [see I], St. Louis and Japanese B encephalitis respectively. It is suggested that W.N. virus has been active in the Sudan, Uganda, Kenya and the Congo; St. Louis in Kenya and the Congo and possibly in the Sudan, and Japanese B in the Sudan and the Congo.—R. E. GLOVER.

BAKHTIN, A. G., & AGAPOV, S. I. (1941). Tkanevaya formolvaktsina protiv chumy svineĭ. **[Formol Tissue Vaccine against Swine Fever].**—*Veterinariya, Moscow.* No. 2. pp. 26–29. 343

Various immunization experiments with formalinized spleen-tissue vaccines for S.F., similar to those recommended by FUTAMURA [*V. B.* **6.** 231.] were performed on healthy piglets and piglets affected with rickets. Two subcutaneous inoculations with 5–10 ml. of vaccine were made; the inoculations were repeated, using double doses, in 9–12 days. 14–32 days after the second vaccination the piglets were experimentally infected with 1–1·5 ml. of virus. Healthy piglets are stated not to have become infected although some piglets showed increased temperature (40·5°–42°C.) three days after infection and developed diarrhoea. The control animals contracted S.F. Less encouraging results were obtained in piglets affected with rickets.

—A. MOLDAWSKY.

MELNICK, J. L. (1942). **Concentration of Dilute Solutions of Virus of Mouse Encephalomyelitis by Pervaporation and Ultracentrifugation.**—*Proc. Soc. exp. Biol., N.Y.* **49.** 553–557. 344

Mouse brains infected with the FA strain of Theiler's mouse encephalomyelitis virus, were diluted 1×10^7 in distilled water, and the solutions were found to be no longer active. From the dilute solution samples of 4 liters were concentrated by placing in cellophane tubes over which was blown a current of air until the volume was reduced to 40–80 ml. This technique is referred to as "pervaporation".

Further concentration was achieved by clarifying this solution with the angle centrifuge, and then sedimenting the virus in a preparative ultracentrifuge at 142,000 × *g.*, and taking up the sediment in phosphate buffer pH 8·0.

By this means the active material in 4 liters of brain dilution was concentrated into less than 1 ml., with very little loss in the total activity.—R. A. K.

PINKERTON, H., & MORAGUES, V. (1942). **Comparative Study of Meningopneumonitis Virus, Psittacosis of Pigeon Origin, and Psittacosis of Parrot Origin.**—*J. exp. Med.* **75.** 575–580. 345

There is a close relationship between the meningopneumonitis virus of FRANCIS & MAGILL [(1938). *J. exp. Med.* **68.** 147.] which was isolated from ferrets inoculated with throat washings of a patient with an influenza type of illness, and a virus recovered by the authors from thiamin-deficient pigeons. Both these viruses are morphologically identical with that of typical psittacosis, but differ from it in that they are both more pathogenic for pigeons when injected intracranially and do not produce typical liver lesions when injected intraperitoneally into mice.

Some psittacosis viruses of pigeon origin showed experimentally a greater pathogenicity for pigeons than viruses of parrot origin.—J. C. BUXTON.

LORING, H. S., & SCHWERDT, C. E. (1942). **Studies on the Purification of Poliomyelitis Virus. I. Yields and Activity of Preparations Obtained by Differential Centrifugation.**—*J. exp. Med.* **75.** 395–406. **346**

Extracts of the medullae and cords of normal monkeys and of monkeys infected with poliomyelitis virus were freed of tissue debris by centrifuging, lipoidal material being removed from the supernatant fluid by ether extraction. After filtering the resultant aqueous layer through an adsorptive medium (cellite), it was subjected to 3 or 4 centrifuge cycles, each of 1½ hours' duration, in a Pickles' air-driven centrifuge with an average centrifugal force of 79,000 x gravity.

When glycerolated cords and medullae from normal animals were subjected to this procedure, a high molecular weight N-containing constituent separated out. If, however, the fresh material was frozen and stored for several weeks before use, the amount of sedimentable N was negligible. On the other hand, with similarly heated infected material, small amounts of highly active sediment, containing N, P, and carbohydrate, were obtained. This material regularly produced poliomyelitis when 1 ml., containing 5×10^{-9} g. of N was injected intracerebrally into monkeys.

—J. LOCHIEL MCGIRR.

PAVLOVSKIĬ, E. N. (1941). **[Vectors, Reservoirs, and Focal Distribution of Tick Encephalitis—Human].**—*Neuropath. & Psychiatr. Moscow.* **10.** 10–12. [Abst. from abst. in *Bull. Hyg., Lond.* **17.** 694]. **347**

A summary of work previously reported [see *V. B.* **12.** 498].

CHUMAKOV, M. P., VOROBIEVA, N. N., & SOFRONOVA, N. E. (1940). **[The Detection of the Virus of the Tick-Borne Encephalitis of Man in Certain Rodents of the Ural Forests.]**—*Arch. Sci. Biol.* **59.** 86–91. [In Russian: English summary]. [Abst. in *Bull. Hyg., Lond.* **17.** 173, slightly amended. Signed: H. H. S.] **348**

Strains of human tick-borne encephalitis virus were isolated from two hares, two squirrels and a striped squirrel or "chipmunk" in the Urals. They were wild rodents found naturally infected. During August-October the authors found on these animals nymphs of *Ixodes persulcatus*, which are capable vectors of the virus; there might be as many as 16 on a rodent.

From examination of a small number—fourteen hares and one squirrel—of rodents killed in an encephalitis focus none seemed to be infected with the virus. The authors believe, therefore, that the hares carry the virus temporarily "only during the period when they are attacked by spontaneously infected ticks" [but more investigation will be needed before such can be accepted as a fact].

IMMUNITY

BOYD, W. C. (1942). **On the Mechanism of Specific Precipitation.**—*J. exp. Med.* **75.** 407–419. **349**

The apparent discrepancies between independent experimental findings [see HOOKER & BOYD—*V. B.* **12.** 591.] and the so-called "alternation", "mutual multivalence", or "lattice" theory of serological reactions led B. to initiate critical investigations into the mechanism of specific precipitation. Thirty-four mono, di, tri, and hexavalent haptens, in which the determinant groups were either carboxylic or arsonic acids, were tested against antisera to haemocyanin-*p*-aminobenzoic and haemocyanin-arsonilic acids.

In spite of the fact that inhibition experiments indicated that all the compounds reacted with their appropriate antibodies, no precipitation was recorded with any of the carboxy haptens, and many of the arsonic compounds, even those containing three adequately spaced reactive groups. The validity of the "alternation" hypothesis, in so far as it depends on the multivalence of antigen and antibody, would therefore appear to be seriously challenged. After discussing the importance of the relative positions of the determinant groups in the multivalent hapten molecule, and the dependence of precipitability on the relative absence of "solubilizing" polar groups (*e.g.* hydroxyl, carboxyl), B. proposes an alternative hypothesis to explain the primary stages of precipitation.

According to his theory, precipitation is due to lowering of solubility by mutual neutralization of polar groups of antibody and hapten, associated with concomitant steric interference with other polar groups of the antibody molecules in the complex. Thus haptens will not precipitate if, after combination with antibody, there are still sufficient solubilizing polar groups on the outer parts of the compound: in the same way, compounds with determinant polar groups far apart may also be inprecipitable since antibody molecules combining with them, being also far apart, will not lose solubility by steric hindrance. [An important paper which should be read in full by those interested in immunochemistry.]—J. LOCHIEL MCGIRR.

WOLFE, H. R. (1942). **Precipitin-Production in Chickens. I. Interfacial Titers as Affected by Quantity of Antigen Injected and Aging of Antisera.**—*J. Immunol.* **44.** 135–145. **350**

In experiments designed to test the differences in production of precipitin in the chicken and rabbit, 645 chickens and ten rabbits were used. The chickens were injected in one series with varying quantities of the serum proteins of sheep, ox, or buffalo blood. Ring tests made within three days of bleeding gave high titres in a large majority of animals, when the dosage varied from 1–4 ml. of undiluted serum protein. Doses as low as 1·75 ml. of a 1 : 9 dilution of serum protein stimulated excellent precipitin production. The titres of chicken antisera tested nine or more days after bleeding showed a marked increase over the titres produced within 24 hours of bleeding. Nine out of ten rabbit antisera showed no such change, while the tenth showed a very slight increase. Chickens given two or more series of injections at approximately monthly intervals gave phenomenally high-titred precipitins, much higher than those produced in rabbits.—I. W. B.

CANNON, P. R. (1942). **Antibodies and the Protein-Reserves.**—*J. Immunol.* **44.** 107–114. **351**

C. presents a general hypothesis regarding the mechanism of antibody production based on the assumption that the intracellular reticulo-endothelial elaboration of globulin is altered in the presence of antigen, a proportion of the protein being specifically modified to form antibody globulin [see also SABIN—*V. B.* **12.** 95]. Accordingly, if this idea be accepted, antibody production must be directly influenced by dietary intake of protein and amino-acids just as is normal globulin production, and, further, any disease which leads to a reduction in plasma or tissue protein must eventually lead to the withdrawal of antibody-globulin reserves from antibody-producing cells [see also MADDEN & WHIPPLE—*V. B.* **10.** 797].

The implications of the theory are discussed in relation to war problems such as mass starvation in

occupied Europe, " war oedema ", and the capacity of starving peoples to combat infection.

[" War oedema " was widespread in Germany towards the close of 1914–18, and was established as due in large measure to hypoproteinaemia because of grossly insufficient dietary protein intake.]—J. L. McG.

PHAIR, J. J., & ROOT, C. M. (1942). **Diphtheria Immunization: Simultaneous Active and Passive Immunization in Guinea Pigs. I. The Antigenicity of the Toxoids, Fluid and Alum Precipitated, in the Presence of Passive Antitoxin. II. The Protective Power of Antitoxin Administered in the Presence of the Toxoids.**—*Amer. J. Hyg.* **35.** 251–264 and 377–380. **352**

I. Experiments on g. pigs indicated that fluid or alum-precipitated diphtheria toxoids injected along with suitable amounts of antitoxin, retained their antigenic power to an appreciable degree. The alum toxoid stimulated a greater antigenic response than the fluid toxoid, presumably because its relative insolubility allowed it to remain active in the body long after the antitoxin had been eliminated.

II. Groups of g. pigs were given subcutaneous injections of antitoxin, along with varying amounts of fluid or alum-precipitated toxoid. An interval of 48 hours was allowed for *in vivo* antigen-antibody combination, before the protective power of the antitoxin was tested by the administration of lethal doses of toxin. Interference with the protective power by toxoid was demonstrated when the antigen was given in quantities sufficient to neutralize all of the antitoxin. Smaller doses of toxoid left sufficient free antitoxin in the circulation to protect most of the animals used.

—ISOBEL W. BURTON.

PHAIR, J. J. (1942). **Diphtheria Immunization. Secondary Stimulus in Guinea Pigs as a Test of Toxicogenicity of " Avirulent "** *C. diphtheriae.*—*Amer. J. Hyg.* **35.** 386–392. **353**

In a series of experiments on g. pigs, it was demonstrated that the production of a secondary rise in the serum antitoxin level, with minute doses of toxin or toxoid, in previously sensitized animals, constituted an extremely delicate method of testing preparations for the presence of diphtheria toxin. A second series of experiments was carried out to determine the presence of toxin, or antibody stimulating substances, in culture filtrates of five avirulent strains of *Corynebacterium diphtheriae.* An interval of six weeks was allowed to elapse between the primary and secondary stimuli, in order to allow the antitoxin rise occasioned by the first injection to reach its maximum level. Any rise subsequent to the sixth week could then be safely attributed to the second injection. The results obtained did not justify the inference that any of the strains tested was definitely toxicogenic, although a large amount of filtrate from one strain gave a slightly suggestive increase in antitoxin level.—ISOBEL W. BURTON.

FERGUSON, L. C., STORMONT, C., & IRWIN, M. R. (1942). **On Additional Antigens in the Erythrocytes of Cattle.**—*J. Immunol.* **44.** 147–164. **354**

The authors succeeded in identifying a further 23 antigens in the red blood cells of cattle, in addition to the seven already reported [see *V. B.* **11.** 878]. Identification was carried out by means of absorption and lytic tests on iso-immune sera. It appears that each cellular character is produced by a single gene, although some may be products of linked genes. These findings may be put to practical use in cases of disputed parentage in cattle, as each cellular antigen is passed only directly from parent to offspring, so that an antigen is found in the cells of an animal only if it is present in the cells of one or both parents.—ISOBEL W. BURTON.

PRESSMAN, D., CAMPBELL, D. H., & PAULING, L. (1942). **The Agglutination of Intact Azo-Erythrocytes by Antisera Homologous to the Attached Groups.**—*J. Immunol.* **44.** 101–105. **355**

Agglutination of sheep erythrocytes coupled with azophenylarsonate, by antiazophenylarsonate rabbit serum, occurred when as few as 60 arsonate groups per red blood corpuscle were present. As each r.b.c. would require about eight million antibody molecules to cover it, it was therefore evident that aggln. did not result from a change in the surface properties of the cells caused by the presence of a layer of antibody protein.

R.b.c. attached to ovalbumin by means of bisdiazotized benzidine were agglutinated by anti-ovalbumin serum. Untreated r.b.c. were slowly agglutinated by bisdiazotized benzidine alone, presumably through the formation of azobiphenylazo linkages between cells, but r.b.c. with added ovalbumin were unaffected.

Sheep r.b.c. with attached diazotized arsanilic acid or ovalbumin, which could be agglutinated strongly by anti-arsanilic acid serum or anti-ovalbumin serum respectively, were found also to be agglutinated by anti-sheep-cell serum. This showed that even those cells which were coated with ovalbumin still had sufficient free surface to react with anti-erythrocyte serum.—ISOBEL W. BURTON.

See also abstr. **329** (Anaphylaxis), **412** (Tissue Invasiveness), **459** (Antigens), **374** (Antibodies).

PARASITES IN RELATION TO DISEASE [GENERAL]

DIKMANS, G. (1942). **Internal Parasites of Cattle.**—*Circ. U.S. Dep. Agric.* No. 614. pp. 39. **356**

A very useful little booklet dealing with the more important helminth and protozoan parasites of cattle.

The worm parasites are first discussed in general terms under the headings " life-history " and " general preventive measures ". Each parasite is then dealt with individually under the headings :– location, appearance, distribution, life-history, symptoms and lesions, treatment, and prevention. D. does not regard intratracheal injection as of much value against " husk ". The various types of life-history are well illustrated by diagrams and there are some excellent photographs.

—H. E. HARBOUR.

WATKINS, C. V., & HARVEY, L. A. (1942). **On the Parasites of Silver Foxes on some Farms in the South-West.**—*Parasitology.* **34.** 155–179. **357**

The following helminths are recorded from the 154 silver foxes examined :– *Taenia pisiformis, Capillaria plica; C. aerophilai, Crenosoma vulpis, Uncinaria stenocephala, Toxocara canis* and, in one case, *T. mystax. Otodectes cynotis, Demodex folliculorum, Ctenocephalus canis, Spilopsyllus cuniculi,* and *Eimeria vulpis* were also found. Of all these parasites, by far the most serious were the nematodes. It was found that the degree of infestation varied widely between one farm and another. The range of *C. vulpis* appeared to be associated with soil acidity, which is probably a limiting factor in the distribution of the mollusc intermediate hosts. No farm was entirely free of the other nematodes. Although *T. canis* was fairly prevalent it is probably the least important, since it is the most easily expelled by vermifuges. *U. stenocephala* was very prevalent on all but one farm. *C. plica* was, in general, more uniformly common than the other species. *C. aerophila* was present on all farms and there appeared to be an inverse correlation between infestation with this parasite and with *C. vulpis.*

A marked resistance to the five common nematodes appeared to be developed by about the fifth month of age. No adequate correlation was established between faecal egg counts and worm burden. It was found that females were greatly in excess of males in all nematodes except *T. canis*. Examination of two red foxes from the same area and of 12 from Shropshire showed that, with the exception of *C. vulpis*, the same nematodes were present. *T. pisiformis* occurred in much higher numbers than in the silver foxes. *Eimeria vulpis* was not present. A single specimen of *Linguatula serrata* was found in the gut of one fox. *O. cynotis* was also recorded in one case, and *S. cuniculi* and *Monopsyllus sciurorum* were found in two cases. In addition, *Ixodes ricinus* and one egg of *Trichodectes vulpis* were recovered. There was no evidence of the transmission of *Crenosoma striatum* from the hedgehog to silver or red foxes.—M. L. B.

See also abst. **491** (Text-Book).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

EICHLER, W. (1941). Untersuchungen zur Epidemiologie der Aussenparasiten. III. Aussenwelteinflüsse und Epiklima in ihrer Wirkung auf die Verbreitung von Ektoparasiten. **[Research on Epidemiology of Ectoparasites. III. Influence of Environment and Epiclimate on Spread of Ectoparasites].**—*Arch. wiss. prakt. Tierheilk.* **77.** 45–51. [For part II, see *V. B.* **11.** 166]. **358**

Examinations of a variety of host animals confirm the conclusions of BECKER (1933) that the main factors determining the choice of habitat and mode of life of the ectoparasite are the temperature, size, age, food, physiological condition and immunity mechanism of the host, the type of sense organs, numbers, and virulence of the parasite, and protein incompatibility and genetic constitution of host and parasite. E. adds to this list the important factor humidity. He recalls BUXTON'S finding that the human louse is rare in Iraq during the hot summer but appears in great numbers during the winter. The "heterotropic" character of the habitat chosen by many ectoparasites is also discussed; *Ornithomyia biloba*, for instance, is very common in Germany but does not occur in England. Conditions in the nests of birds, as well as soil character (important for pupal development), topographical specialization, and seasonal changes are described in relation to their influence on the parasite.—E. R. P.

EICHLER, W. (1942). Parasitische Pilze beim Taubenfederling. (Beobachtungen über biologische Eigentümlichkeiten bei Mallophagen. V.). **[Fungi Parasitic on Pigeon Lice].**—*Zbl. Bakt. I.* (*Orig.*). **149.** 50–51. **359**

Trenomyces circinans infection of the abdominal region of a pigeon feather louse is described. E. speculates upon whether the infection may sterilize the louse or whether its eggs may become infected with the fungus during oviposition.—J. G. CARR.

ZUMPT, F. (1942). Vorstudie zu einer Revision der Gattung Rhipicephalus Koch. III. Die gefleckten Rhipicephalus-Arten. IV. Die Variationsbreit der Nachkommen eines Weibchens von Rhipicephalus bursa Can. u. Fanz. V. Zur Kenntnis afrikanischer Rhipicephalusarten. **[Studies Preliminary to a Revision of the Genus *Rhipicephalus*. III. The Spotted *Rhipicephalus* spp. IV. Range of Variation in Progeny of a Female *R. bursa*. V. African Species of *Rhipicephalus*].**—*Z. Parasitenk.* **12.** 433–443, 444–450 and 479–500. [For part I, see *V. B.* **12.** 34. Part II not available]. **360**

III. The characteristics of the various species of *Rhipicephalus* belonging to the *R. pulchellus* group are discussed, and it is suggested that *R. pulchellus*, *R. maculatus*, and *R. dux* may be accepted as species, whilst *R. humeralis* should be classed as a subspecies of *R. pulchellus*. *R. ecinctus* is considered to be a synonym of *R. pulchellus*, as transitional forms occur between the two extreme types.

IV. Investigations are described into the variations which may occur in strains of *R. bursa* raised from individual females, and into the variations which may be produced as the result of nymphs being detached before full engorgement. In work with *R. bursa* raised on rabbits, it was found that females raised from fully engorged nymphs might be as small as those raised from nymphs detached before full engorgement. Strains raised from individual females might vary considerably from each other in respect of size, scutal punctation, and of development of the anal plates, but when large numbers of the progeny of various females were available for examination there could be no doubt that the ticks all belonged to the same species, in view of the transitional forms which were present.

When a few ticks collected in the field show minor differences from a recognized species, the existence of a new species should not be accepted until investigations have shown whether such differences are constant.

V. The *R. capensis* group which includes *R. sulcatus* and *R. bursa* is described. Detailed descriptions of the various species are given, and variations which may occur in the scutal punctation and in the form of the anal plates in *R. capensis* are discussed in great detail. This species is divided into two subspecies, *R. capensis capensis* and *R. capensis longus*.—U. F. RICHARDSON.

—. (1941). Deutsches Reich. Runderlass des Reichsministers des Innern, betr. Bekämpfung der Räude der Einhufer. **[Germany: Circular on Mange in Equines].**—*Reichsgesundheitsblatt.* **16.** 620–621. **361**

A circular emphasizing the necessity for the strict observance of measures to deal with equine mange. Where gas cells are available their use is advocated, otherwise treatment with the proprietary phenol preparation, durosept, is recommended.—H. E. HARBOUR.

See also absts. **348** (Ticks), **483** (Tabanids & Ticks), **357**.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

DESCHIENS, R. (1942). Données biologiques relatives aux substances toxiques vermineuses. **[Biological Data on Toxic Substances of Helminth Parasites].**—*Bull. Soc. Path. exot.* **35.** 115–122. **362**

This is mainly a discussion of the literature concerning the toxic action of certain helminths, with particular reference to the records of MACHEBOEUF and MANDOUL [*V. B.* **10.** 264 and 595]. Using their technique, D. obtained protein-free extracts from two samples of *Parascaris equorum*, derived from different sources. He injected each extract into the hearts of three g. pigs, and observed a considerable difference in the toxicity of the extracts, possibly associated with the state of sexual maturity, age, and sex of the worms. Extracts similarly prepared from the leech, *Hirudo officinalis*, and from *Gastrophilus intestinalis*, were inoculated into g. pigs with negative results. D. points out the possibility of determining the part of the patho-

genic action associated with allergy (protein), and that concerned with intoxication by non-protein substances. Symptoms produced by both protein and non-protein extracts of ascarids in g. pigs are, however, essentially those of anaphylactic shock.—M. L. BINGHAM.

MORRILL, D. R., & SHAW, J. N. (1942). **Studies of Pathology in Cattle Produced by Liver Fluke** (*Fasciola hepatica*).—*Sta. Bull. Oregon agric. Exp. Sta.* No. 408. pp. 30. **363**

An account of experimental work and of the behaviour of *F. hepatica* inside the body of the host, and of the lesions produced.

Experiments were carried out on five adult cattle, and detailed studies made of two normal and ten condemned livers from an abattoir. The bulletin is well illustrated by photographs.

Two animals were each given 1,000 cercarial cysts and one of these was later given a further 48 cysts. Two other animals were kept as controls. Weekly detailed blood examinations were carried out during the nine-months' period of the observation; a limited number of faecal examinations was also made. Ova appeared in the faeces at 11 weeks and persisted till slaughter. The pathogenic effects noted were limited to a mild anaemia and eosinophilia; there was little, if any, effect on general body condition. The numbers of flukes recovered in the two experimental animals far exceeded those found in the abattoir specimens. Presence of focal subcapsular lesions suggested that the young fluke reaches the bile ducts by migration from the peritoneal cavity and penetration of the capsule and parenchyma, as it does in the sheep. This suggestion was confirmed in an experiment in which three-day-old flukes recovered from the peritoneal cavities of experimentally infected g. pigs were injected intraperitoneally into a yearling heifer. Two young flukes were subsequently recovered from a typical subcapsular lesion in this animal. [Unfortunately no mention is made of the interval between infection and slaughter in this case.] —H. E. HARBOUR.

HOWELL, N. G. (1941). **Trichiniasis in Wales.**—*Publ. Hlth, Lond.* **55.** 5–9. **364**

This article contains substantially the same information as was later published elsewhere [see *V. B.* **12.** 456].—H. E. BYWATER.

DELAUNE, E. T., & MAYHEW, R. L. (1941). **Studies on Bovine Gastro-Intestinal Parasites. III. The Blood Picture in Hookworm and Nodular Worm Infection with some Observations of the Normal.**—*Trans. Amer. micr. Soc.* **60.** 293–308. [For other parts, see *V. B.* **12.** 39]. **365**

Blood examinations extending over a period of months were made on two calves infested with *Oesophagostomum radiatum*, on three infested with both *O. radiatum* and *Bunostomum phlebotomum*, and on uninfested controls. Full data are presented for erythrocyte, leucocyte, and differential leucocyte counts. The infections generally caused a decrease in the erythrocyte counts and an increase in the leucocyte counts. Data relevant to the size of the worm infections were published in parts I and II.—D. G. DAVEY.

ANDREWS, J. S., & MALDONADO, J. F. (1942). **Intestinal Pathology in Experimental Bovine Esophagostomiasis.**—*Amer. J. vet. Res.* **3.** 17–27. **366**

The lesions associated with *Oesophagostomum radiatum* in experimentally infected calves occur mainly in the ileum, caecum, and colon, although the larvae may penetrate the intestinal wall at any point from the pylorus to the anus. The principal inflammatory changes take place in the submucosa, but larvae may be found in any part of the intestinal wall. In single infections, young larvae up to five days after infection were associated with small dark nodules. Larvae observed 5–10 days after infection were associated with lesions having white centres composed chiefly of leucocytes. The majority of lesions 9–10 days old and older were ulcerated and contained no larvae, as the latter had escaped into the lumen of the intestine. Histologically, lesions arising from single infections were mild and consisted of polymorphonuclear leucocytes. The maximum severity was reached about ten days after infection and the majority of lesions had disappeared 22–32 days later. Lesions associated with multiple infections were, however, much more severe, consisted largely of eosinophiles with some giant cells, and were encapsulated by epithelioid cells. They persisted up to 182 days after infection. Contrary to the findings of other observers, bacteria were apparently of little importance as secondary invaders. No pathological changes were observed in association with *O. radiatum* adults.—M. L. BINGHAM.

*ROUBAUD, E., & DESCHIENS, R. (1941). Action des hyphomycètes prédateurs sur les larves de Synthetocaules et de Bunostomes. [**Action of Predatory Moulds on Larvae of** *Synthetocaulus* **and** *Bunostomum*]. —*Bull. Soc. Path. exot.* **34.** 127–130. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 133]. **367**

Embryos and larvae of the cattle and sheep lungworms are preyed upon by three species of predatory moulds, *Dactylella bembicodes*, *Arthrobotrys oligospora*, and *Dactylaria elipsospora*. The larvae of ruminant hookworms (*Bunostomum*) are also caught and destroyed by the above moulds.—E. R. PARISER.

BAUDET, E. A. R. F. (1941). Ueber die Resistenz des Meerschweinchens gegenüber wiederholten Infektionen mit Ascaris lumbricoides vom Schwein. [**Resistance of G. Pigs to Repeated Infection with** *A. lumbricoides* **from Swine**].—*Z. InfektKr. Haustiere.* **58.** 79–93. **368**

B. describes experiments in which g. pigs were fed with various doses of mature eggs of *A. lumbricoides* in attempts to set up a resistance against a lethal dose of these eggs. The eggs were obtained by dissection of mature ascarid worms and were incubated for at least four weeks at 26°–28°C.; they contained fully developed embryos when used for infection trials. A lethal dose (usually 30,000 eggs) was found to cause death from verminous pneumonia.

In preliminary trials, g. pigs given three successive monthly doses of 100, 200, and 400 eggs did not resist infection with 40,000 eggs given three months after the last infection. In a second series, 12 successive weekly doses, of 100 rising to 1,200 eggs, were given and a test dose of 20,000 eggs was given 14 days after the last infection; results did not indicate any difference between dosed g. pigs and controls.

In two further series of experiments 16 g. pigs which had received sublethal doses of 13,000–15,000 eggs were used, ten g. pigs having received three such doses, three two doses, and three one only. These 16 g. pigs all resisted a test dose of 26,000 or 30,000 eggs given one month after the last dosing. Of 16 unimmunized control g. pigs, only three survived. B. concludes that resistance to lethal infection was achieved by dosing with sublethal doses of eggs; further trials suggested that such resistance was still present five months after the last dosing.

[The figures are very striking when presented as above but are less so when it is considered that the 16 experimental g. pigs referred to were the only survivors of various groups totalling 38 g. pigs, the remaining 22 having died from verminous pneumonia following the same " sublethal " doses. All 16 were therefore initially resistant to doses which had killed the other 22 g. pigs.

Individual natural immunity may thus have played at least some part in the results obtained, the experimental g. pigs being essentially selected, and compared with unselected controls.]

Examination of some of the resistant g. pigs 2–3 months after the last dosing showed traces of long-standing inflammatory foci in the lungs, but no larvae were present. The resistance is therefore assumed to be a true immunity rather than premunity.—H. E. H.

SWARTZWELDER, J. C. (1941). *Toxocara cati* (**Cat Ascarid**) **Infection in Man. Report of an Additional Case.**—*J. trop. Med.* (*Hyg.*). **44.** 61–62. [Author's summary copied *verbatim*]. **369**

Toxocara cati infection in the human host is very infrequent, although the exact number of cases on record is not entirely clear. An additional, apparently authentic, case is put on record herewith.

MASYUKOV, A. V. (1941). K etiologii "secheniya" (parafilyarioza) u krupnovo rogatovo skota. [**Aetiology of Parafilariasis in Cattle**].—*Dokl. vsesoyuz. Akad. sel'skokhoz. Nauk.* No. 6. pp. 30–31. **370**

Two haemorrhagic nodules were observed on the side of the neck of a five-year-old working bull in the Tuapse region. One of the nodules was closed by a blood clot, whereas blood leaked out of the other. As no symptoms characteristic of parafilariasis developed, the condition was wrongly diagnosed. The animal was destroyed for other reasons. After the skin of the neck in the region of the nodules had been removed, a nematode was found in the subcutaneous tissue, which was identified as a female *Parafilaria bovicola*, a parasite of cattle in the Philippines. A description of the parasite is given.—E. R. PARISER.

See also abst. **356** (Cattle Parasites), **357** (Fox Parasites), **480** (Helminth Control).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

HIERONYMI, E., & BRACHETKA, J. (1942). Über primäre Hautgeschwülste vom Drüsentypus; zugleich eine Kritik der sogenannten Basalzellentumoren in der Haut des Hundes. [**Primary Skin Tumours of Glandular Types; Critical Study of So-Called Basal Cell Tumours of the Skin of the Dog**].—*Arch. wiss. prakt. Tierheilk.* **77.** 254–282. **371**

The authors review critically the literature dealing with primary epithelial tumours of the dog's skin which have been considered of glandular origin. They suggest a suitable nomenclature and classification, supported by a study of 31 such tumours which they have examined. The so-called "apocrine glands" found in the dog's skin are confined to the head, neck, and back and they are probably related to the skin glands occurring in the axilla of man and in the genital organs and areola of the nipple. Their secretion is formed by breakdown of the inner portions of the lining epithelial cells. It is doubtful whether true sweat glands exist in the dog, some workers considering that even those found in the pads of the feet do not function as sweat glands.

Neoplasms of skin glands are classified as follows. (1) Sweat gland adenoma (solid hydradenoma), developing from the apocrine glands and consisting of tubular structures lined by cuboidal epithelium and either containing a homogeneous coagulated material or in other parts forming solid epithelial columns devoid of a lumen. The epithelial cells rest on a hyaline basement membrane and there is a myo-epithelial layer as in the normal apocrine glands. (2) Hyperplasia and adenoma of sebaceous glands. These are common in the skin of the face and abdomen and the structure is very similar to that of the normal sebaceous glands. (3) Adenoid cystic epithelioma (Brooke's tumour). These are very small tumours composed of squamous epithelium within which cystic spaces develop. The histogenesis is not known and the tumour in dogs is exactly similar to Brooke's tumour in man. (4) Carcinoma adenoides cutis. As compared with the other types this tumour grows to a relatively large size (hazel nut to an apple) and often ulcerates but as with the other types there is no invasion of the local lymph nodes or metastasis in the internal organs. One of six cases treated by operative removal recurred. The epithelial cells forming the tumour are very pleomorphic and often form syncytial masses. The arrangement is bizarre, the cells forming configurations of varying kinds (horse shoes, starfish, spider's web). The nuclei are hyperchromatic and mitoses are easily found. No connexion with the epidermis could be traced and there was no keratinization. It is suggested that this tumour arises from apocrine glands and represents a less differentiated form of the first type of tumour above: it has been described previously in the dog as a basal cell carcinoma.—E. G. W.

PARKER, R. F., & THOMPSON, R. L. (1942). **The Effect of External Temperature on the Course of Infectious Myxomatosis of Rabbits.**—*J. exp. Med.* **75.** 567–573. **372**

Only rabbits convalescent from vaccinia were used in the experiments, in order to avoid cross-infection; details are given of the preparation of the strain of myxoma virus used.

It was found that, when rabbits were kept at temperatures of 33°–36°C., little difference existed between the viral titres of control and experimental animals and recovery was only 10%, but when kept at higher temperatures (36°–42°C.), 82% of experimental animals survived.

Precipitin tests and tests for the presence of protective antibodies in the sera of recovered animals were made and details are given, but the data resulting from these tests were insufficient for any final conclusion to be drawn. The authors do suggest, however, that there does not seem to be a perfect correlation between the apparent severity of the initial disease and the response to reinoculation.—J. C. BUXTON.

SHARP, D. G., TAYLOR, A. R., BEARD, D., & BEARD, J. W. (1942). **Electrophoresis of the Rabbit Papilloma Virus Protein.**—*J. biol. Chem.* **142.** 193–202. **373**

The results are described of electrophoresis measurements in the Tiselius U-tube. Mobility determinations were made over the infectivity stability range from pH 3·5–8·0.

The virus preparations migrated homogeneously showing a single boundary, the amount of boundary spread corresponding with a high degree of uniformity. As the virus was insoluble in the buffer systems used from pH 4·2–6·0, the iso-electric point was determined with the Northrop-Kunitz microscopic technique and found to be at pH 5·0.—R. A. KEKWICK.

GORER, P. A. (1942). **The Role of Antibodies in Immunity to Transplanted Leukaemia in Mice.**—*J. Path. Bact.* **54.** 51–65. **374**

G. describes transplantation experiments involving a "stem-cell" leucaemia, which arose in a pure strain of albino mice in which the normal incidence of leucaemia was 2%. All mice of this strain receiving subcutaneous injections of over 10,000 cells, derived from lymph nodes or spleen of affected mice, developed

leucaemia. Mice of a second (black) strain were entirely resistant to transplantation. Susceptibility to artificial infection was found to depend upon two unlinked dominant genes, one of which was probably identical with a gene determining the presence of an erythrocyte antigen.

Suspensions of leucaemic cells, in sera from normal black mice, were virulent for the albinos, but suspensions in sera from immunized blacks either failed to set up leucaemia, or delayed the development of the disease. In those cases in which a tumour formed at the site of inoculation, mice injected with immune serum developed much smaller swellings than unprotected animals.

Immune serum from the black strain of mice was shown to contain haemagglutinins and protective antibody. The latter appeared to be of importance in the retardation of the onset of artificially induced leucaemia. It was absorbed by " albino " erythrocytes and leucaemic cells, but not by leucaemic cells from the black strain. Both antibodies were absorbed more rapidly by leucaemic cells than by erythrocytes.

G. concludes that the laws governing transplantation of leucaemia cells are the same as those concerned in the transplantation of other tissues, and that circulating iso-antibodies play an important part in immunity to transplants.—ISOBEL W. BURTON.

See also absts. **485, 486** (Fowl Paralysis).

DISEASES, GENERAL

BURNET, F. M. (1941). **The Biological Approach to Infectious Disease.**—*Med. J. Aust.* Nov. 29th. 607–612. **375**

B. discusses the stages through which theories of the aetiology of infectious diseases have passed, *viz*, the supernatural, the climatic, and that of the specific micro-organism; there is now a fourth stage, the ecological, in which disease is studied in the light of host-parasite relationship.—A. W. BANKS.

BLAKE, F. G., WELT, L. G., & CRAIGE, B., Jr. (1942). **An Apparently Undescribed Infectious Exanthema.**—*Yale J. Biol. Med.* **14.** 573–579. **376**

A brief preliminary account of an undiagnosed exanthema in human beings, believed to be a new disease. In an outbreak described in one family, three of the five members became ill. There was a history of contact with goats which might have been correlated with the incidence, but the goats were healthy; agglutination tests for *Brucella melitensis* infection were negative. The connexion of the disease with goat contact is discussed. No corroborative evidence to incriminate goats was found.

—. (1942). **Discussion on the Control of the Diseases of Cattle Inimical to Man. Brucellosis and Sterility.** [Speakers: GOULD, G. N., PARKES, A. S., HAMMOND, J., WILSON, G. S., FOLLEY, S. J., STEELE-BODGER, H. W., SCORGIE, N. J., & ROWSON, L. E. A.]—*Proc. R. Soc. Med.* **35.** 635–642. **377**

Believing that the eradication of bovine brucellosis in Britain, by the ideal method of early detection of infected animals and their removal (preferably by slaughter) from the herd, is impossible of attainment, GOULD considers that the only practical policy is vaccination with an approved attenuated vaccine, combined with suitable educational propaganda in herd management. In order to control infertility and sterility, there should be a system of periodic veterinary examination of cows and heifers combined with suitable treatment. In his opinion, 80% of affected cows are curable provided appropriate treatment is undertaken early.

PARKES quoted the evidence indicating that the maintenance of pregnancy and the initiation of birth are partly controlled by placental activity, and suggested that damage to the placenta, even if not sufficiently severe to destroy its metabolic functions, may well inhibit its endocrine activity sufficiently to make continued gestation impossible.

HAMMOND discussed fertility in cows at different times of the year in England. He stressed the importance of examining the ovaries, prior to the use of injections of the follicle-stimulating hormone of pregnant mare serum or of horse pituitary gland, to see that the cow really is in an anoestrus condition before the injection is made, for otherwise, if a young corpus luteum is present in the ovary, there is the danger that cysts may be produced; if a mature corpus luteum is present in the ovary, two or more eggs may be shed at the next heat period and so twins, triplets or more produced.

FOLLEY had found no relation between the phase of the oestrus cycle at which the injection of follicle-stimulating hormone is made and the number of ova resulting from the injection. In experiments on bulls giving sperm with low motility, he found in three cases that treatment with chorionic gonadotrophin resulted in an improvement in the motility of the sperm.

G. S. WILSON gave figures and estimations for human brucellosis in Great Britain, concluding that about 500 cases may occur annually. STEELE-BODGER, SCORGIE, and ROWSON discussed stilboestrol therapy and other methods of inducing oestrus. SCORGIE also spoke of vitamin C therapy for infertile bulls.—H. V. HUGHES.

*TOMAN, R. V. (1941). Kommen in den Niederlanden " Grass-Sickness ", " Forage-Poisoning ", " Auto-Intoxicatie " bei Pferden vor? [**The Possible Occurrence of " Grass Sickness " in Holland**].—*Tijdschr. Diergeneesk.* **68.** 666. [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 444]. **378**

T. suggests that in Holland many cases in horses formerly described as indigestion, intestinal catarrh, rheumatic colic, paralysis, etc. are in reality " grass sickness ", as seen in Scotland and in other parts of the United Kingdom.—ALEX. B. PATERSON.

KRAGE, P. (1942). Zur Aetiologie der enzootischen Leber-Gehirnerkrankung bei Pferden in Ostpreussen. [**Aetiology of Enzootic " Liver and Brain Disease " in Horses in East Prussia**].—*Berl. Münch. tierärztl. Wschr.* May 15th. 156–157. **379**

J. describes a disease of farm horses in East Prussia, which closely resembles and may be identical with a similarly named disease in Finland [*V. B.* **12.** 458]. In East Prussia it occurs in late summer as a long-drawn-out outbreak among horses in a small area. The duration of illness is 1–6 days and the mortality rate 70–80%. There are symptoms of encephalitis and of liver disease (icterus). The liver is the principal site of change noted P.M., being in a state of severe acute dystrophy or yellow dystrophy with but little normal tissue left.

A suggestion was made that the disease might be a mould poisoning, resulting from the ingestion of clover attacked by *Dothidella tripolii* (= *Polythrincium tripolii*), but one small feeding trial failed to give this theory much support.—J. E.

HOLLE, A. H., HOLLE, H., & WEISCHER, F. (1942). Ueber Wesen, Ursachen und Behandlung der Hufrehe des Pferdes. [**The Nature, Causes, and**

Treatment of Laminitis in Horses].—*Berl. Münch. tierärztl. Wschr.* Feb. 6th. 37–39. **380**

The authors recognize an allergic and a mechanical form of laminitis. The former is subdivided into intestinal, parturient and cutaneous types, depending on the site at which the hypothetical allergen concerned is active. Allergic laminitis usually is not followed by deformity of the hoof.

Mechanical laminitis is due to overuse of any particular leg or legs and is accompanied and followed by pathological changes in the hoof.—M. LANDAU.

PROFÉ, O. (1942). Über Ursachen von Trächtigkeits- und Schwergeburtsschäden bei Stuten sowie von Fohlenschäden. **[Causes of Losses of Breeding Mares and of Foals].**—*Tierärztl. Rdsch.* **48.** 271–274. **381**

This is an analysis of one year's records, as collected by an insurance company, of deaths in pregnant and parturient mares and in foals. It deals with 525 mares and 1,322 foals. The original must be consulted for details.—J. E.

*REICHE, W. (1941). Reihenuntersuchungen an 140 Jungrindern auf Fortpflanzungsstörungen. **[Serial Examinations of 140 Young Cattle for Reproductive Disorders].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 592]. **382**

These examinations showed that, besides malformations, only ovarian TB., trichomoniasis, acute catarrhal vaginitis, cervicitis, and endometritis were responsible for unsuccessful fertilization; infections such as slight vaginitis, vestibulitis, etc., probably do not prevent fertilization.—E. R. PARISER.

COHRS, P. (1942). Pathologische Anatomie und Pathogenese der wichtigsten Schweinekrankheiten. **[Pathology and Pathogenesis of the Most Important Pig Diseases].**—*Dtsch. tierärztl. Wschr.* **50.** 1–4. **383**

A brief account of the pathological anatomy of the commonest affections of swine encountered in the region of Hanover. The conditions include swine erysipelas, swine fever, swine paratyphoid, piglet influenza (*Ferkelgrippe*), acute heart failure, and porcine encephalomyelitis.

Deaths from acute heart failure are most common in fattening pigs weighing about 100 lb. The animals usually fall dead soon after leaving the trough and the only macroscopic lesion seen at autopsy is a slight mottling of the heart muscle, somewhat similar to the appearance in foot and mouth disease. Sections show primary circulatory damage resulting in anaemic necrosis of areas of myocardium, especially in the right side of the heart. C. also describes similar lesions in the skeletal muscles in some cases. The condition hardly ever occurs in animals which have access to grass and this may be due either to the exercise which they take and which is impossible for fattening pigs kept in close confinement, or to lack of some nutritive requirement present in grass or soil. The cardiac lesions are somewhat similar to those of angina pectoris in man. —E. G. WHITE.

GLÄSSER. (1941). Fortschritte unserer Kenntnisse des Rotlauf-, Schweineseuche, und Schweinepestkreises in den beiden letzten Jahrzehnten. **[Advances in our Knowledge of Swine Erysipelas, Swine Plague and Swine Fever in the Last Two Decades].**—*Berl. Münch. tierärztl. Wschr.* April 4th. 169–172; May 9th. 229–232; July 11th. 337–340, and Oct. 24th. 513–518. **384**

G. discusses in detail swine erysipelas, including its incidence, susceptibility of individual species of animals and of man, the causes, the causative bacteria, the clinical symptoms, diagnosis, and prophylaxis. Prophylaxis is dealt with under (a) maintenance of natural resistance, (b) prophylactic inoculation, and (c) veterinary legal control and curative treatment.

Swine plague is divided into :– (1) the condition previously described as acute swine plague now included in (a) acute swine fever, (b) fibrinous inflammation of serosa and joints, and (c) the pasteurella infection; (2) what was previously called chronic swine plague, now diagnosed as (a) enzootic pneumonia, and (b) piglet influenza [see *V. B.* **12.** 292].

The general nature and public health aspects of swine paratyphoid are dealt with.

There is a general review of the swine fever problem. The incidence of S.F. in Germany showed a big increase in 1921–1922; thereafter there was a gradual decrease followed by an unexpected sharp rise in 1939, which fell again later in 1939. It is stated that the virus was cultivated for over ten generations in media containing lymph node, spleen, of bone marrow. Sheep and goats are susceptible and may harbour and excrete the virus for a long time, without showing clinical signs. A claim that rabbits have been infected has also been made. The forms in which the disease occurs in pigs are described, along with diagnostic features during life and P.M. and the microscopic appearance of the lesions. The viability of the virus and the steps which are necessary to clear infection from premises are dealt with.

Good protective results are claimed for Eystruper [a laboratory of A.G. Farbenindustrie] virus-serum inoculation in healthy animals, but generally the spread of the condition could not be stopped because of carriers. For these reasons the slaughter policy was adopted in an outbreak in Minden in 1939; this policy became law in 1940 for the whole Reich. Compensation was given and "sound" and "conditionally sound" carcasses [categories defined according to the law in Germany] are salvaged by boiling. Inoculation is prohibited.—J. Z.

LOOSLI, C. G. (1942). **The Histogenesis of Cells in Experimental Pneumonia in the Dog.**—*J. exp. Med.* **75.** 657–672. **385**

Pneumonia was produced in dogs by intrabronchial injection of pneumococci and the cytological changes in the lung were studied at intervals after the injection which varied from one hour to 22 days. The inflammatory cells which entered the alveoli came mainly from the blood. Neutrophile leucocytes were gradually replaced by mononuclear cells derived by transformation of the lymphocytes and monocytes of the blood which had entered the alveolar spaces. The main activity of the septal cells consisted of enlargement without detachment from the alveolar walls. Consolidation of the lung was due to direct spread of the pneumococci through the alveolar pores and along the bronchial tree by aspiration and coughing. Spread of the organisms to the interstitial tissue was secondary to intra-alveolar infection and played no part in extension of the consolidation.

Dogs reinfected 3–4 weeks after the first infection showed a similar cytological response, but the pneumonic changes were less severe and developed more rapidly than in the animals infected for the first time. —E. G. WHITE.

LÁSZLÓ, F. (1942). Zur pathologischen Histologie der Cystitis chronica polyposa. **[Histopathology of Cystitis Chronica Polyposa (Bovine Chronic Haematuria)].**—*Dtsch. tierärztl. Wschr.* **50.** 287–288. **386**

L. examined histologically the bladders of two bovines with chronic vesical haematuria. The characteristic features comprised subepithelial haemorrhage, marked oedema of the mucosa with fibrinoid swelling of collagen fibres, new formation of a vascular and

oedematous connective tissue extending through the submucosa and down to the muscularis, and infiltration of the whole thickness of the bladder wall with neutrophile leucocytes and mononuclear and plasma cells. The polypoid outgrowths of the mucosa consisted of oedematous granulation tissue, infiltrated with inflammatory cells and often denuded of epithelium.
—E. G. WHITE.

LÁSZLÓ, F. (1941). Pathologische Histologie der hypoplastischen Nieren. **[Histopathology of Hypoplasia of the Kidneys].**—*Dtsch. tierärztl. Wschr.* **49.** 589–590. **387**

A description of three cases of renal hypoplasia, in a pig, an ox, and a horse. In each there was incomplete development of glomeruli and tubules and replacement of renal parenchyma by a cellular connective tissue or by fat. There was hyaline degeneration of some glomeruli and of the connective tissue stroma. Blood vessels were numerous and showed a marked hypertrophy of the tunica media.—E. G. WHITE.

FEOKTISTOV, L. I. (1939). Yalovost' korov v Kurganskom plemsovkhoze. **[Sterility in Cattle of the Kurgan Breeding Farm].**—*Sborn. Rabot chelyabinsk. sel'skokhoz. opyt. Stant.* **1.** No. 2. 67–81. Chelyabinsk. **388**

Observations were made on a large breeding farm in south-west Siberia, stocked with cattle of local breeds and Shorthorn cross-breds. F. discusses in detail the economic losses caused by infertility, unequal distribution of calving time, and delayed pregnancies of first-calf heifers.

The main causes of infertility, in his opinion, were uterine affections caused by retention of placenta which is stated to be mainly due to Ca, P, and vitamin D deficiencies. Analysing 30 cases of retention over a period of five years, he found that nine cows remained permanently sterile and the remaining 21 although they became pregnant, were affected in subsequent periods with irregular oestrus and required longer time to get in calf. Among other causes mentioned were anoestrus in cows and heifers, especially during winter months; this was regarded as being due to an avitaminosis. F. considers the breed, age, and the length of the non-lactating period to be of no significance. He recommends adequate feeding, keeping of service records, and planning and distribution of calvings.—A. MOLDAWSKY.

ROESTI, W. (1941). Ueber Drusenbildung am Sehnervenkopf des Pferdes. Neuritis exsudativa nervi optici. **[Exudative Neuritis of the Optic Nerve of Horses].**—*Arch. wiss. prakt. Tierheilk.* **77.** 81–103. **389**

Two cases of this condition are described in great detail. The main symptoms were bilateral blindness and total mydriasis. Ophthalmoscopic examination revealed accumulations of whitish plaque-like spots of exudate on the surface of the optic disc along with multiple haemorrhages. The pieces of exudate tended to diminish in size in the course of some weeks, but the blindness remained.

Histologically, atrophy and degeneration of the optic papilla and the adjoining part of the optic nerve were found. The whitish structures on section consisted of organized inflammatory exudate. Transmission experiments were unsuccessful. No single aetiological factor could be discovered, although in one of the cases there existed a suspicion of mercury poisoning.—M. L.

DIMITROFF, I. R. (1942). Ueber die Osteomyelosklerose der Hühner. **[Osteomyelosclerosis in Fowls].**—*Wien. tierärztl. Mschr.* **29.** 199–204. **390**

The condition described under the above heading consists of a generalized, symmetrical sclerosis of cancellated bone and a filling in with osteoid tissue of the marrow cylinders of long bones. Affected bones show no external changes in shape or consistency.

Of 92 adult fowls examined, D. found this condition existing to a greater or lesser extent in 88%. Young birds were only rarely affected; cage birds and wild birds were never affected.

D. considers that in view of the high incidence of this condition in otherwise normal fowls, it does not represent a pathological process but merely an adaptation of the skeletal apparatus to the modified requirements of domestication.—M. LANDAU.

PULLINGER, B. D., & PIRIE, A. (1942). **Chronic Inflammation Due to Implanted Collagen.**—*J. Path. Bact.* **54.** 341–344. **391**

Collagen prepared from fresh ox cornea was implanted under the skin of two rabbits and the implanted material and surrounding tissue was excised at intervals over a period of 12 weeks and examined microscopically. The histological picture after the fifth week, by which time the collagen had been absorbed, was very similar to the nonspecific "chronic inflammatory tissue" frequently encountered in pathological material in cases where the causal agent cannot be identified. Traces of collagen could be recognized within large foamy macrophages by staining with van Gieson's stain or Mallory's aniline blue. The histological features included predominance of macrophages, lymphocytes and mature connective tissue fibres, presence of granular leucocytes, plasma cells, multinucleated giant cells, corpora amylacea and modified lymph nodes (sometimes), and the absence of micro-organisms.

It is suggested that many examples of this type of reaction in human pathology may be due to alteration in the chemical state or physical relations of the host's own less soluble structures rather than to any living extrinsic agent.—E. G. WHITE.

See also absts. **338, 396, 411** (Haematology), **400** (Digestive System).

NUTRITIONAL AND METABOLIC DISORDERS

GILYARD, A. T., & GILYARD, R. (1942). **Grass Silage—A Hazardous Horse Feed.**—*Cornell Vet.* **32.** 317–321. **392**

Grass silage consisting of oats and field peas was fed to horses and cattle. Towards the end of winter the silage was noticed to be decayed and mouldy. Within 72 hours nine horses became affected with symptoms suggesting botulism and seven succumbed. Polyvalent botulinus antitoxin produced temporary alleviation of symptoms and apparently protected two animals when used as a prophylactic. A living foal removed from an affected pregnant mare showed symptoms of paralysis. *Cl. botulinum* could not be demonstrated in samples of the silage. The cattle were not affected.—S. J. GILBERT.

KULLANDER, S. (1942). Fettets färg hos slaktdjur. **[The Colour of Fats of Slaughtered Animals].**—*Skand. VetTidskr.* **32.** 193–199. [English summary]. **393**

K. discusses the chemical classification of the lipochromes, and states that while in the horse and ox the colour is due to carotene, in the fowl it is due to xanthophyll, which is not a vitamin-A precursor. There is no lipochrome present in the fat of pigs. The present system of judging horse and beef carcasses according

to the degree of whiteness of the fat, although it may give some indication of the age of the animal, is to be condemned because under this system the carcass with most carotene is graded lowest.

BRIGGS, G. M., Jr., MILLS, R. C., ELVEHJEM, C. A., & HART, E. B. (1942). **The Effect of Added Cystine in Purified Rations for the Chick.**—*J. biol. Chem.* **144.** 47–52. **394**

From experiments with young White Leghorn chicks, it was concluded that the so-called " cartilage growth factor " [see HEGSTEDT *et al.*—*V. B.* **10.** 202; **11.** 52, and **12.** 233.] is, in effect, a combination of chondroitin, arginine, glycine and either cystine or methionine. For optimum growth, it appeared necessary to add 0·5% arginine, 3% glycine, and either 0·3% cystine or 0·5% methionine to a diet containing 18% of alcohol-extracted casein, dextrin, oil, minerals, and sources of all known vitamin factors. These aminoacids helped also to prevent gizzard erosion. Cystine was ineffective in the absence of arginine and glycine. Chondroitin was not shown to have any growth-promoting activity, but it assisted in the prevention of gizzard erosion.—ALASTAIR N. WORDEN.

FROST, D. V., SPITZER, E. H., ELVEHJEM, C. A., & HART, E. B. (1941). **Some Effects of Cobalt and Liver Substance on Blood Building in Dogs.**—*Amer. J. Physiol.* **134.** 746–754. **395**

When 3–6 mg. Co per kg. body weight were added to the milk diet, supplemented with Cu and Fe, of dogs, there was a transitory polycythaemia. Addition of Co to the mineralized milk diet of young dogs was without effect on the blood picture, but anorexia, vomiting and loss of weight occurred.

If dogs were rendered anaemic by phlebotomy, given an unfortified milk diet and then, at a later date, dosed with Co, there was little effect on blood haemoglobin. If then Cu and Fe were also added to the diet, the customary haematopoietic response did not occur. This inhibition was abolished by giving whole dry liver or liver extract and rapid Hb regeneration occurred.

It was pointed out that the liver differs from mineralized milk in its blood-building properties on a quantitative and perhaps also qualitative basis.—J. D.

ROBSCHEIT-ROBBINS, F. S., & WHIPPLE, G. H. (1942). **Copper and Cobalt. Related Hemoglobin Production in Experimental Anemia.**—*J. exp. Med.* **75.** 481–487. **396**

Experiments were carried out to show the effect of various doses of Cu and Co either alone or combined with a standard dose of iron on haemoglobin production in dogs rendered anaemic by the technique of repeated bleeding.

The metal salts were added as supplements to a complete and standard diet on which all the experimental animals were maintained. The daily feeding of 5–15 mg. of Cu sometimes exerted a definitely favourable effect on haemoglobin production, but, at other times, the response was negative. Doses of 30–40 mg. of Cu daily were often inhibitory and probably toxic, but, on withdrawal of these doses of Cu, production of haemoglobin over and above the basal output was observed for a period. This irregular response to Cu feeding was in marked contrast to the response to Fe. Dogs rendered anaemic by repeated bleeding are deficient in Fe but still retain greater liver reserves of Cu than normal dogs. It is considered, therefore, that the response to Cu feeding is not due to correction of a deficiency.

In contrast to Cu, and contrary to certain previous reports, Co failed completely to stimulate haemoglobin production in these experiments, but instead exerted an inhibitory effect sometimes lasting over several weeks when more than minimal doses were given. On other grounds, also, the authors find no support for the claim that Co causes polycythaemia in dogs.—W. R. MUIR.

COMBS, G. F., NORRIS, L. C., & HEUSER, G. F. (1942). **The Interrelationship of Manganese, Phosphatase and Vitamin D in Bone Development.**—*J. Nutrit.* **23.** 131–140. **397**

The phosphatase content of the bones of chicks subsisting on a diet deficient in vitamin D was increased. When the same rachitogenic diet was simultaneously deficient in manganese, the phosphatase activity remained at approximately normal levels. When a diet deficient only in Mn was given, the phosphatase activity of the bones was reduced.—J. DUCKWORTH.

BELL, G. H., CUTHBERTSON, D. P., & ORR, J. (1941). **Strength and Size of Bone in Relation to Calcium Intake.**—*J. Physiol.* **100.** 299–317. **398**

A description is given of apparatus devised to determine the strength of bone. The principles involved are those commonly employed in bending and twisting tests of structural materials.

Rats were given diets containing 0·075–1·39% Ca. Although there was progressive increase in Ca retention, body weights did not differ seriously. With increasing Ca content of the diet, the size and Ca content of the femora increased with corresponding improvements in bending and twisting strengths as the bone shell increased in thickness. Inclusion of more than 0·36% of Ca in the diet led to no further improvements in bone size or quality.

X-ray studies of the bones were made and the results might have been identified as evidence of bone atrophy or rarefaction. The cause of these appearances was thinning of the femoral shell and not any qualitative change in the bone.—J. DUCKWORTH.

SMITH, F., & MCLEAN, F. C. (1941). **Experimental Rickets. Blood and Tissue Changes in Puppies Receiving a Diet very low in Phosphorus, with and without Vitamin D.**—*Arch. Path.* **32.** 387–408. **399**

Puppies were given a diet markedly deficient in P with, or without, supplements of vitamin D. Marked hypercalcaemia developed in animals deficient in P and vitamin D; when vitamin D was included in the ration even greater degrees of hypercalcaemia were observed. Since reduction in Ca intake restored the serum Ca levels to normal the increases appeared to be of alimentary origin. Serum inorganic P values were markedly reduced in P-deficient puppies, but the magnitude of the reduction was uninfluenced by vitamin D intake. Florid rickets developed in all P-deficient animals, irrespective of vitamin D administration.

When puppies were given the basal diet supplemented with P, growth was normal but there were increased amounts of uncalcified osteoid tissue and the condition was regarded as one of borderline rickets. Supplementing with vitamin D in addition to P led to normal bone development.

In rachitic animals, serum phosphatase was elevated and there was a moderate increase of phosphatase at the costochondral junctions in both animals deficient in P and vitamin D and in those deficient in D alone. By histological staining (Gomori technique), the phosphatase of bones was shown to be associated with hypertrophic cartilage cells and with osteoblasts. It was absent from uncalcified osteoid tissue of both normal and rachitic animals. Acid-soluble organic P was uninfluenced.—J. DUCKWORTH.

COHRS, P. (1942). Hyperkeratose des Pansens, A-Avitaminose und Kälberruhr. **[Hyperkeratosis of the Rumen, Avitaminosis A, and Calf Scours].**—*Berl. Münch. tierärztl. Wschr.* July 10th. 209–212. **400**

C. examined calves from four herds in which losses from calf scours were very high and found an overgrowth with hyperkeratosis of the mucous membrane of the rumen. The histological appearance is described and illustrated in four figures.

The changes were ascribed to avitaminosis A and this was confirmed by the very low or negative values obtained for vitamin A content of livers of some of the cases.

Pathogenesis and control by attention to the cows' diet are discussed.

C. believes that calf scours is primarily a condition of avitaminosis A.—J. E.

KEENER, H. A., BECHDEL, S. I., GUERRANT, N. B., & THORP, W. T. S. (1942). **Carotene in Calf Nutrition.**—*J. Dairy Sci.* **25.** 571–583. **401**

The authors report the results of experiments designed to measure the minimum carotene requirements of Guernsey and Holstein calves from birth to eight months of age. The levels of carotene and vitamin A in the blood were found to reflect with reasonable accuracy the adequacy of the carotene intake. The level of vitamin A appeared to be the better indicator of the nutritional state.

An important relationship was traced between the environmental temperature and the blood carotene and vitamin A levels, the body-weight changes, and the condition of the calf. It was found that the minimum intake of carotene necessary to prevent the appearance of deficiency symptoms rose from 12 μg. per lb. body weight per day at environmental temperatures between 50° and 70° F. to more than double this amount during severe winter weather, possibly because of the increased metabolic rate.

Examination of the eye by the ophthalmoscope appeared to be the most sensitive method of detecting the existence of vitamin A deficiency. Respiratory disturbances and diarrhoea were found to be more prevalent during periods of low blood vitamin A and low carotene intake. Histopathological effects of vitamin A deficiency were present in animals with a low intake although practically all such animals would have been considered normal by the average dairyman.—W. R. MUIR.

THORP, W. T. S., KEENER, H. A., BECHDEL, S. I., & GUERANT, N. B. (1942). **Observation on the Pathology of Dairy Calves on Low Vitamin A Diets.**—*Amer. J. vet. Res.* **3.** 27–31. **402**

Autopsies were conducted upon 25 dairy calves which had been subjected to three different suboptimal levels of carotene intake: in general, changes were greatest in the most deficient animals. *Ante-mortem* findings had included periodical diarrhoea, symptomatic of the enteritis which was found in many cases and which had given rise to swollen and oedematous mesenteric lymph nodes. Gross lesions were observed in the kidneys in 14 cases and in the livers of 11 cases, while a typical broncho-pneumonia was present in four of the calves. Histological examination showed that the renal lesions comprised degeneration of the epithelium of the proximal convoluted tubules, together with inflammatory changes, and that the hepatic lesions consisted of degeneration and necrosis. Degenerative changes were found also in the testes, being confined to the germinal epithelium lining the tubules. The only evidence of metaplastic changes in the epithelial tissues which were encountered was in the renal calices of some cases, and in the tracheae of two calves only.—A. N. WORDEN.

COWARD, K. H. (1942). **The Relative Needs of Young Male and Female Rats for Vitamin A.**—*Brit. med. J.* April 4th. 435–436. **403**

A summary is given of experiments in which, after a period of depletion to exhaust reserves, a dosage of cod liver oil or other vitamin A or carotene source, was given. The dosage was the same irrespective of sex. Death occurred more frequently in males than in females and the conclusion is drawn that male rats are more sensitive to vitamin A deficiency than females. A subsidiary conclusion was that males and females show an equal capacity for converting carotene to vitamin A.—J. DUCKWORTH.

CORRELL, J. T., & WISE, E. C. (1942). **Antirachitic Properties of A.T.10 for the Rat and Chicken.**—*J. Nutrit.* **23.** 217–228. **404**

The antirachitic potency of A.T.10 (*Antitetanisches Präparat* No. 10, a preparation of which the active component is dihydrotachysterol) was assayed by means of rats and chicks. The potency was 30,000 I.U. per g. by the rat technique and 6 I.U. per 100 g. of ration was the minimal protective dose for chicks. Toxic symptoms began to appear at five times this dosage. When A.T.10 was compared with vitamin D_2 for antirachitic potency for chicks, A.T.10 was almost 200 times as effective as D_2 and four times as effective as vitamin D from cod liver oil, all comparisons being made on the basis of rat units.—J. DUCKWORTH.

MATTILL, H. A., & GOLUMBIC, C. (1942). **Vitamin E, Cod Liver Oil and Muscular Dystrophy.**—*J. Nutrit.* **23.** 625–631. **405**

Evidence is presented for the identity of the muscular dystrophies produced in rabbits by diets containing cod liver oil and by diets deficient in vitamin E. Both conditions could be prevented or cured by timely administration of α-tocopheryl acetate, which was found to be less effective when administered intraperitoneally than when given by mouth. It is considered that cod liver oil induces a state of E-avitaminosis by virtue of its tendency to undergo auto-oxidation and to promote the destructive oxidation of vitamin E. The deleterious effects of oxidative rancidity were demonstrated by feeding a mixture of lard, cod liver oil, and wheat germ oil in which this condition was well developed. Addition of wheat germ oil to an E-deficient diet was only temporarily effective and ultimately inadequate in the presence of unstabilized cod liver oil. The protective action of wheat germ oil was greatly improved by the addition of an anti-oxidant (hydroquinone), but its stabilizing action was lost during prolonged storage. The effective vitamin E content of a diet containing cod liver oil depended upon the freshness of the oil and on the conditions and duration of storage of the mixed diet. None of the members of the vitamin B complex appears to be concerned with nutritional muscular dystrophy.—W. R. MUIR.

EPPSTEIN, S. H., & MORGULIS, S. (1942). **Factors Influencing the Onset and Cure of Nutritional Muscular Dystrophy.**—*J. Nutrit.* **23.** 473–482. **406**

Administration of cod liver oil to young albino rabbits on diets very low in vitamin E is shown to convert latent muscular dystrophy into an active dystrophy. The condition of oxidative rancidity set up by cod liver oil in the intestine is admitted to be an important factor in the destruction of the small amounts of α-tocopherol in the experimental diet, but whether cod liver oil itself directly exerts an injurious action by promoting the dystrophic effect of E-avitaminosis must be determined by further experiments. A simplified and accurate test for detecting active muscular dystrophy is found in the urinary creatine to total creatinine ratio which rises rapidly with the onset of the acute phase of the dystrophy.

Parenteral administration of the water-soluble disodium phosphate ester of α-tocopherol caused neither local reactions nor evidence of discomfort and

afforded effective cures in cases of nutritional muscular dystrophy, in contrast to the oil-soluble acetate ester which is probably only slowly absorbed after injection. α-tocopheryl acetate is effective, however, when administered orally and more so than the free alcohol, owing to its greater resistance to destruction when rancidity exists in the gut. It is pointed out that E-avitaminosis may arise not only from direct deficiency, but also from imperfect absorption or excessive destruction in the body and that this may explain discordant results from the clinical use of α-tocopherol in the treatment of certain diseases.—W. R. Muir.

Coward, K. H., Morgan, B. G. E., & Waller, L. (1942). **The Influence of a Deficiency of Vitamin B_1 and of Riboflavin on the Reproduction of the Rat.**—*J. Physiol.* **100.** 423–431. **407**

When rats were maintained on a diet deficient in vitamin B_1 but otherwise adequate, anoestrus occurred. Administration of B_1 corrected the anoestrus but reproduction and lactation were markedly subnormal. Addition of vitamin E did not improve the fertility of these rats. If, instead of being given a supplement of B_1, the animals were transferred to the complete stock diet of the colony reproduction and lactation were normal, provided that the depletion period had not exceeded 120 days. These results show that the B_1 free diet was lacking not only in vitamin B_1 but in some other unidentified factor, which was not vitamin E, necessary for reproduction.

Riboflavin deficiency, produced by Lindholm's diet also produced anoestrus and irreparable effects on reproduction occurred if a total, or almost total, deficiency period of 68 days was enforced. When the deficiency was less severe, administration of riboflavin abolished the anoestrus and normal cycles and normal reproductive activity returned.—J. Duckworth.

Mathiesen, E. (1942). Betydningen av Vitamin C i Sölvrevens Ernaering. [**Importance of Vitamin C for the Nutrition of Silver Foxes**].—*Skand. Vet-Tidskr.* **32.** 315–323. [English and German summaries]. **408**

M. fed silver fox cubs for 11 months on a diet free from vitamin C. Growth and development were normal in every way, with no symptoms of scurvy or of any other disease, and it is concluded that farm foxes have either no, or else a completely insignificant, vitamin C requirement.

Shwachman, H., & Gould, B. S. (1942). **Serum Phosphatase in Experimental Scurvy.**—*J. Nutrit.* **23.** 271–281. **409**

G. pigs receiving a scorbutogenic diet showed a progressive reduction in "alkaline" serum phosphatase which ultimately reached very low levels. "Acid" phosphatase and serum inorganic P were unchanged. Administration of ascorbic acid to scorbutic g. pigs led to sharp increases in phosphatase activity followed by a sharp reduction after withdrawal. The alteration in phosphatase activity was shown to be the outcome of changes in the quantity of enzyme present and not of alterations in the levels of any inhibitors or activators. There was no *in vitro* activation of enzyme action by added ascorbic acid.

Alterations of a similar nature did not occur when the same diet was given to rabbits, which synthesize their ascorbic acid.—J. Duckworth.

Shaw, J. C. (1942). **A Comparison of the Acetone Body Metabolism of the Lactating Mammary Gland of the Normal Cow with that of the Cow with Ketosis.**—*J. biol. Chem.* **142.** 53–60. **410**

The lactating mammary gland of the cow with ketosis shows an increase of over 100% in its utilization of β-hydroxybutyric acid with diminished oxygen consumption. As in the normal cow, acetoacetic acid is not utilized. The β-hydroxybutyric acid utilized accounts for all the oxygen consumed in the active mammary gland of the cow in ketosis, but in normal cows only 37% of the oxygen consumption is required for β-hydroxybutyric acid oxidation, the remainder being involved in the oxidation of fat.—J. Duckworth.

Schmitt, F. (1939). Die Stellung der Erythrocyten im Mineralhaushalt. [**Place of Erythrocytes in Mineral Metabolism**].—*Ergebn. inn. Med.* **57.** 241–259. [Abst. in *Nutr. Abstr. Rev.* **11.** 442, copied *verbatim.* Signed: A. R. Sharples (U.S.A.)]. **411**

This review of recent literature deals with changes in the Cl, Na, K and Ca content of the erythrocytes in acidosis, alkalosis, cardiac oedema, malignancy and cirrhosis of the liver. The relation of Pb to mineral metabolism is discussed.

See also abst. **310** (General Nutrition).

PHYSIOLOGY AND ANATOMY

Friedemann, U. (1942). **Blood-Brain Barrier.**—*Physiol. Rev.* **22.** 125–145. **412**

The older view that the cerebrospinal fluid played an important role in the exchange of substances between the blood and brain is now untenable, except when the capillaries of the choroid plexus or the meningeal vessels are damaged.

This review deals with the distribution of substances between the blood and central nervous system, the distribution between blood and c.s.f. is an entirely different problem which is not discussed.

The investigations reported show that the capillaries of the c.n.s. are permeable to basic aniline dyes, cobra venom, lamb dysentery toxin, fowl plague virus, antibodies, and a great variety of drugs. They are impermeable to acid dyes, tetanus, diphtheria, botulinus and staphylococcus toxins, to most if not all neurotropic viruses (except that some of them may grow through the endothelium), potassium ferrocyanide, arsphenamine and Bayer 205, and are relatively impermeable to iodides, bromides and thiocyanates. It is thus clear that the capillaries of the c.n.s. are endowed with a selective permeability. The choroid plexus and meningeal vessels are not concerned with the exchange of substances between the blood and c.n.s. The experimental evidence seems to indicate that the ability of substances to pass the capillaries of the c.n.s. is determined by their electrochemical properties. The capillaries in the majority of organs are permeable to electronegative and, to a less extent, electropositive substances. Those of the choroid plexus, ciliary plexus and the peritoneum are permeable to acid (electronegative) and impermeable to basic (electropositive) dyes. The cerebral capillaries are permeable to substances carrying a positive or no charge at the pH of the blood while they are impermeable to those carrying a negative charge. The permeability of the capillary system as a whole, however, may be more correctly correlated to the ξ-potential than to the electrical charge. It is interesting to note that dried collodion membranes are permeable to cations but impermeable to anions, they therefore resemble the capillaries of the c.n.s.

Although antibodies can pass out of the cerebral capillaries their coefficient of distribution between blood and brain is approximately 1 : 20–1 : 60, and their intrathecal administration appears to be justified.

Tetanus antitoxin is 80 times more potent in preventing local tetanus by the intraventricular than by the intravenous route. There are useful tables giving the results of cataphoresis experiments with various toxins and viruses.—JOHN FRANCIS.

VANLANDINGHAM, A. H., HENDERSON, H. O., & BOWLING, G. A. (1942). **Studies on the Chemical Composition of the Blood of Dairy Cattle. III. The Normal Concentration of Inorganic Phosphorus in the Whole Blood of Dairy Cattle and Factors Affecting it.**—*J. Dairy Sci.* **25.** 537–548. **413**

Inorganic P was determined in over 600 composite samples of whole blood taken from 59 cows and heifers in normal states of health and nutrition. Each composite sample consisted of aliquots from six daily samples taken over a period of ten days, and each analytical figure therefore represented an average of six bleedings at a particular period.

Growing dairy heifers showed an increase from about 6·6 mg. % at one month old to about 6·9 mg. % at nine months old, followed by a decline to about 5·7 mg. % in the 27th month, or to 5·2 mg. % if there is late pregnancy. The value at the beginning of the first lactation was about 4·8 mg. %, falling to about 4·4 mg. % in later lactations. Minor fluctuations occurred throughout the course of lactation. Age seemed to be the main factor influencing the blood level, and neither the season at which the calves were born nor changes from indoor to outdoor environment had any effect.—A. B. P.

GRASMANN, H. (1941). Untersuchungen über das Blutbild des Rindes. **[Research on the Blood Picture of Cattle].**—*Wien. tierärztl. Mschr.* **28.** 383–384. [Abst. only given]. **414**

A summary of the ground covered in investigations on the blood of healthy and diseased cattle and of cattle kept under various physiological conditions (including cattle which had received tuberculin injections). Full clinical reports on all the animals were available. The mean values and the range of values for 16 normal cows were determined for the following constituents :– haemoglobin, erythrocytes, leucocytes, large and small lymphocytes, polymorphs, eosinophiles, basophiles and monocytes.—F. AYLWARD.

BENDELLA, A. (1941). Ueber die Verteilung des Blutzuckers zwischen Blutkörperchen und Plasma beim Huhn. **[Partition of Blood Sugar Between Corpuscles and Plasma in the Fowl].**—*Wien. tierärztl. Mschr.* **28.** 414. [Abst. only given]. **415**

Blood sugar estimations were carried out in the whole blood and plasma of hens by the method of Hagedorn and Jensen; haematocrit determinations were also obtained. The results indicate that of the total sugar in the blood 16·3% was in the corpuscles and 83·7% in the plasma.—F. AYLWARD.

AMOROSO, E. C., FRANKLIN, K. J., & PRICHARD, M. M. L. (1941). **Observations on the Cardio-Vascular System and Lungs of an African Elephant Foetus.**—*J. Anat.* **76.** 100–111. **416**

The material for this paper was a ten-month male African elephant foetus. The chief observations were made on the foetal circulation. The umbilical vein was single and valveless. The division of the liver into lobes was in line with the venous distribution and a distinct ductus venosus was apparent. Two striking features of the external appearance of the heart were the presence of separate apices to the two ventricles, with a wide interventricular notch, and a right and left anterior vena cava. The features within the heart, including the division of the posterior vena cava into right and left terminal divisions, are in accordance with those seen in other mammals. A bicuspid valve was present at the termination of the posterior vena cava. The left valve is connected to the opening of the left A.V.C. and the right valve (eustachian valve) separates the posterior caval channel from the left anterior caval channel. The presence of this bicuspid valve is in accordance with the double A.V.C.

The drainage from the lung was complicated. All the pulmonary veins entered a common sinus on the dorsal aspect of the left atrium. The foramen ovale was continued laterally into the left atrium by means of a tubular valve and the venous inflow from the lung must pass, and impinge on, this valve. This point is of importance in relation to any hypotheses about the functional apposition of the valve at birth.

It is emphasized that the present terminology is not adequate for the description of certain features of the cardiovascular system in mammals from a functional point of view. A new nomenclature, which correlates morphology and function, is described.—C. W. O.

WEGNER, M. I., BOOTH, A. N., BOHSTEDT, G., & HART, E. B. (1941). **Preliminary Observations on the Chemical Changes of Rumen Ingesta with and without Urea.**—*J. Dairy Sci.* **24.** 51–56. **417**

Attempts to demonstrate the conversion of urea into protein *in vivo* were made by sampling the ingesta of the rumen through a fistula at intervals after feeding. Urea fed with the ration disappeared from the rumen within one hour, the disappearance being accompanied by an increase in the ammonia nitrogen but no significant increase in crude protein. The ammonia nitrogen subsequently fell to its normal level 4–6 hours after feeding and this fall is offered as evidence of protein synthesis as the authors can give no other explanation for this "selective" disappearance. When urea was fed with a low protein ration, a slight increase in the crude protein occurred in the rumen.—A. T. PHILLIPSON.

WISE, G. H., ANDERSON, G. W., & MILLER, P. G. (1942). **Factors Affecting the Passage of Liquids into the Rumen of the Dairy Calf. II. Elevation of the Head as Milk is Consumed.**—*J. Dairy Sci.* **25.** 529–536. [For part I, see *V. B.* **10.** 384]. **418**

Previous work was confirmed and the position of the head during feeding was investigated by feeding milk from a nipple and from an open bucket at various heights and at ground level. The results give overwhelming proof that the position of the head has no influence upon the destination of the milk in the stomach except when the bucket is placed at an extreme height so that swallowing is difficult.—A. T. PHILLIPSON.

NIKITIN, V. I. (1939). Do khimologii rubtsevogo travlennya u zhuĭnikh (telyat). **[Chemistry of Digestion in the Rumen of Calves].**—*Biokhim. Zh., Kiev.* **14.** 203–222. [English summary]. **419**

It is shown that under normal conditions concentrated foods remain a very short time in the reticulum and rumen, but when calves were fed on concentrates a certain amount of retention occurred. This may be explained by the fact that a hay or grass diet provokes a much weaker fermentation of chyme than the concentrated food. Experiments showed that addition of substances such as glucose, fructose, starch, cellulose, saccharose, etc., to the rumen, considerably increased fermentation, but the rise in fermentation was much smaller when these substances were added to grass, hay, or oat fodder, than when added to concentrated foods. Fermentation was markedly less in the fasting animal. Addition of fats such as oleic acid and sunflower-seed oil to the rumen increases gas production. Added proteins (casein, peptones) are decomposed in

the rumen and stimulate carbohydrate fermentation. Rumen contents have always a pH on the acid side and have pronounced buffer properties. Measurements made by an Einhorn saccharimeter showed that acid formation due to fermentation was approximately parallel to gas formation. A detailed review of the literature is given.—E. R. PARISER.

TROITSKIĬ, I. A. (1941). Kormovye vozbuditeli zheludochnogo sokootdeleniya u loshadi. **[Alimentary Stimulation of Gastric Secretion in Horses].**—*Veterinariya, Moscow.* No. 2. pp. 118–123. [French summary]. **420**

Samples of the stomach contents of foals were obtained by applying Heidenhain's method, *i.e.* washing out the stomach followed by a period of 18 hours' fast. Experiments demonstrated that a test meal prepared with bran was a very good stimulator of gastric secretion. Graphs and tables show that maximum acidity of the gastric contents was reached two hours after administration of the test meal. The best times for examination of the stomach contents were three, four, and five hours after feeding. Oats did not appear to stimulate gastric activity to the same extent, the maximum acidity of the gastric juice being observed three hours after food. An interesting comparison is made between pH, total acidity, free HCl, and pepsin of the gastric juice during a period of fast and after stimulation of the gastric glands by intake of food. The activity of the glands depends not only on the stimulation due to the food, but also on the level of uninterrupted secretion during the period of fast.—E. R. PARISER.

*EBERT, F. (1941). Ueber das Auftreten der Brunst bei Rindern nach Abdrücken des corpus luteum persistens und Konzeptionsmöglichkeiten der in dieser Brunst gedeckten Tiere. **[Occurrence of Oestrus in Cows after Expression of Corpus Luteum and Possibilities of Conception during Such Oestrus].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 273]. **421**

Examinations were made of 111 anoestrous cows with only corpus luteum in the ovaries. In 96 (86·5%), oestrus was observed after expression of the corpus luteum; the remaining animals did not respond to the operation. Oestrus occurred in 33·3% of all the animals treated between the second and fourth days, 29% exhibited signs of oestrus between the fifth and tenth days, while in 12 animals oestrus occurred between the 11th and the 20th days. The 96 animals which reacted to the operation were mated and 81 became pregnant.—E. R. PARISER.

BELL, T. D., CASIDA, L. E., & DARLOW, A. E. (1941). **Effects of Estrogen and Progesterone upon the Genital Tract of the Ewe.**—*Endocrinology.* **28.** 441–449. **422**

Vaginal smears were examined from ewes (a) treated with oestradiol, and (b) treated with oestradiol followed by progesterone. Oestradiol resulted in an increased height of the vaginal epithelium of spayed ewes and also in an increase in height of the epithelium of the uterine glands and of the uterine surface. This effect was rapidly lost (within 12 days of the injection), but injections of progesterone, following oestradiol treatment, tended to maintain the increased height of the epithelium.

Uterine glands were found to show little coiling in those spayed ewes given oestradiol and killed in heat, but the addition of progesterone caused an increase in the amount of gland coiling.

Injections of oestradiol greatly increased the height of the cervical epithelium and progesterone appeared to maintain the increased height.—F. AYLWARD.

SILBERBERG, M., & SILBERBERG, R. (1941). **Response of Cartilage and Bone of Growing Mice to Testosterone Propionate.**—*Arch. Path.* **32.** 85–95. **423**

Female mice were injected with testosterone propionate. The proliferation processes of epiphyseal cartilage were inhibited and degeneration, hyalinization, sclerosis and calcification occurred. The effect of inhibiting absorption of cartilage and bone was less in extent and of shorter duration than after oestrogen administration. Prolonged administration of testosterone propionate does not lead to changes other than those occurring in normal old mice. Considerable differences were found in the responses of different strains of mice to the treatment.—J. DUCKWORTH.

GILES, D. D. (1942). **An Experiment to Determine the Effect of the Growth Hormone of the Anterior Lobe of the Pituitary Gland on Swine.**—*Amer. J. vet. Res.* **3.** 77–85. **424**

A preparation ("phyone") of anterior pituitary growth hormone was injected twice weekly for 4½ months into ten pigs, each about 20 weeks of age. Two levels of dosage (3 ml. and 6 ml. per 100 lb. body weight respectively) were used. Littermate controls of the same sex were employed for each animal. There were no significant differences between injected and control pigs in respect of growth, utilization of feed, carcass quality, intestinal length, gland weights, blood Hb, serum Ca or serum inorganic P. Injected animals did, however, exhibit increased calcification of the fibula as determined by roentgenography, and the total ash content of the fibula was higher in the injected group, especially at the higher level of dosage. There were no differences in response between castrated males and gilts.

Histological examination showed that there was an increase in the amount of hyaline cartilage separating diaphysis from epiphyses in the tibiae of the injected group.—ALASTAIR N. WORDEN.

BRIGGS, E. A. (1939). **Anatomy of the Sheep's Brain. A Laboratory Atlas for Students of Zoology.** pp. xiii + 49. Sydney: Angus & Robertson Ltd. [8vo] [6s.] **425**

The primary object of this dissection manual is to serve as an introduction to the study of the principal points of interest in the mammalian brain. The sheep was chosen on account of its size and the ease with which its salient features can be identified.

B. first considers the external features and then recommends a sagittal section. One half is described by tracing the relative tracts and the visible nuclei and ganglia; and the other by making a series of transverse sections, seven in all. This is a reasonable method which, combined with the excellent interspersed dissection directions, should make this a useful book for the student.

The order of dissection could be criticized, but it is impossible to adopt a standard method, and the order suggested should prove suitable for the student.

Reference could profitably have been made to cerebrospinal fluid, the venous sinuses, and the method of removing a brain from the cranium.

The plates, indicating the various levels of brain structure, are good, but it is a pity that more line diagrams, particularly of the fore- and mid-brain, are not included.—C. W. OTTAWAY.

See also absts. **393** (General), **411** (Haematology), **397, 398** (Skeletal System), **456, 377** (Urino-Genital System), **371** (Skin Glands of Dog).

POISONS AND POISONING

SAMPSON, J. GRAHAM, R., & HESTER, H. R. (1942). **Studies on Feeding Zinc to Pigs.**—*Cornell Vet.* **32.** 225–236. **426**

The studies reported were made in connection with those carried out on mares and colts [see GRAHAM *et al.*—*V. B.* **11.** 261]. The feeding of approximately 0·1% Zn, as zinc lactate, in the ration of weanling pigs produced lameness and arthritis similar to that described by GRIMMETT and co-workers [*V. B.* **7.** 399]. The feeding of 100 g. of zinc lactate daily to fattening pigs, weighing 75–100 lb. at the commencement, did not produce any adverse effects by the time the animals had attained bacon-weight. It is considered unlikely that Zn poisoning could arise under normal pig-raising conditions in the U.S.A.—ALASTAIR N. WORDEN.

FINCHER, M. G., & FULLER, H. K. (1942). **Photosensitization—Trifoliosis—Light Sensitization.**—*Cornell Vet.* **32.** 95–98. **427**

Eleven cases of photosensitization are recorded in a stable of 26 draft horses and colts following the ingestion of alsike (*Trifolium hybridum*). At the time of grazing the growth was prolific and the plant in full flower. The lesions varied from a superficial necrosis to severe oedema with sloughing of the skin and subcutaneous tissue, with a foetid odour.

Pruritus developed early and was so intense as to cause the animal to gnaw itself, thereby greatly aggravating the lesions. These occurred only on those white, unpigmented parts of the animal which could be wetted by the dew, *i.e.* the muzzle and extremities of the limbs below the hocks and knees. This peculiar distribution of the lesions suggests that actual contact with the plant and/or wetting of the skin may be important factors in the aetiology of the condition.

Treatment consisted in confining the animals indoors and spraying the affected areas with a preparation of tannic and salicylic acids in alcohol. Recovered animals appeared to develop an immunity and could be returned to the original pasture with safety.

—N. S. BARRON.

I. MERIWEATHER, B. (1941). **Phenothiazine vs. Hemoglobin In Chickens.**—*Vet. Med.* **36.** 374–375. **428**

II. MCCULLOCH, E. C., & NICHOLSON, L. G. (1942) **The Effect of Phenothiazine on the Hemoglobin Concentration of Chickens.**—*Ibid.* **37.** 248–252. **429**

I. Mature hens which received phenothiazine in doses of 0·5–5 g. showed an average decrease in haemoglobin concentration of approximately 2 g. per 100 ml. of blood within 48 hours of receiving the drug. The figure for the decrease was calculated as an average of the haemoglobin readings of a group of birds (nine birds on each dose) because the haemoglobin concentration of individual hens is so variable (9·7–11·1 g. per 100 ml. of blood) that individual observations are not easy to interpret. The decrease produced by the lowest dose was not significantly different from that produced by the highest. It seems that no controls were kept.

II. The main purpose of this work was to test the claim of MERIWEATHER [see I.] that the administration of phenothiazine to chickens causes a fall in the haemoglobin level. The authors failed to support the claim and found that the administration of as much as ten times the therapeutic dose (10 × 0·5 g.) did not significantly lower the haemoglobin concentration in the treated birds. They point out that a number of factors, *e.g.* handling of the birds and temperature changes, cause fluctuations in the haemoglobin level, and these factors have to be carefully controlled in any experimental investigation.—D. G. DAVEY.

DOROGOV, A. V. (1940). K voprosu o razvitii mestnovo protsessa na kozhe u svineĭ pri aplikatsii iprita. **[Effect of Mustard Gas on the Skin of Pigs].**—*Sovyet. Vet.* No. 1. pp. 50–51. **430**

Liquid mustard gas was applied over an area of 50 sq. cm. to the backs of six pigs, the hair being left unshorn. The first symptom appeared after 15 min. in the form of itching and restlessness. Hyperaemia was observed after 6–8 hours on an area of about 100 sq. cm., which increased in size until the 8th–10th day, showing a central core of blue and later brown discoloration. On the 12th day a thick, grey scab formed over an area about ten times the size of the original lesion. On the 24th–25th day the scab began to detach itself, leaving clean granulation tissue. Healing was complete by the 63rd–93rd day. New, softer bristle grew in each case on the affected skin area.

AGRANOVICH, V. A. (1939). Punkty veterinarnoĭ pomoshchi. **[Veterinary Decontamination and First Aid Stations].**—*Sovyet. Vet.* No. 5. pp. 61–65. **431**

This is a detailed description of the organization, lay-out, methods and equipment of first aid stations for animals gassed and otherwise injured in war.

*RIEK, G. W. (1939). Die Beeinflussung der Gelbkreuzerkrankung des Hundes durch Omnadin. **[The Influence of Omnadin on Mustard Gas Injuries in Dogs].**—*Inaug. Diss., Berlin.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **48.** 404]. **432**

The application of omnadin alone (a preparation composed of bile lipoids, neutral animal fats, and proteins said to be derived from nonpathogenic bacteria) had no effect on severe mustard gas lesions. [There is no indication as to why this preparation was expected to be of any particular value.]—E. R. PARISER.

See also abst. **392** (Plant Poison).

THERAPEUTICS AND DISINFECTION

HAWKING, F. (1941). **The Rate of Diffusion of Sulphonamide Compounds.**—*Quart. J. Pharm.* **14.** 226–233. **433**

Twenty-four hours after saturated solutions of various sulphonamide compounds have been placed in contact with 15% gelatin at 15°C., the concentration per 100 ml., 1 cm. away from the interface, is :– sulphanilamide 31 mg., sulphapyridine 1·5 mg., sulphathiazole 2·2 mg., sulphadiazine 0·45 mg., sulphaguanidine 2·6 mg. The diffusion coefficient for these compounds under these conditions is about 0·157. Previous experiments have shown that the penetration of sulphonamides into living or dead tissues is much less extensive than these figures suggest.—J. M. ROBSON.

STRUGGER, S. (1942). Fluoreszenzmikroskopische Beobachtungen über das Eindringen des Prontosil solubile in lebende Bakterien- und Hefezellen. **[Fluorescence Microscopic Observations on the Penetration of Prontosil Soluble into Live Bacteria and Yeast Cells].**—*Dtsch. tierärztl. Wschr.* **50.** 321–322. **434**

The penetration of prontosil soluble into the living cell can be demonstrated by fluorescence-microscopy after staining with acridine-orange. Experiments showed that penetration is most rapid in haemolytic streptococci, *Str. equi* and *Str. pyogenes*, and in coli bacteria; other bacteria such as *Mycobacterium tuberculosis*, *Sarcina lutea* and *Pseudomonas fluorescens* gave

either negative results (*Mycobact. tuberculosis*) or the penetration could be observed only after the cells had been treated for a considerable time with prontosil.

That prontosil soluble really does penetrate the living bacterial cell was proved by the fact that the fluorescence observed after addition of the acridine-orange was diminished or completely extinguished in the cells after the addition of prontosil. The extinguishing action of the prontosil was neutralized by the addition of physiological NaCl. It is stated that for some micro-organisms it is necessary to add the prontosil before the acridine-orange, but the types are not mentioned.

—E. R. PARISER.

WOOD, W. B., Jr. (1942). **Studies on the Antibacterial Action of the Sulfonamide Drugs. I. The Relation of *p*-Aminobenzoic Acid to the Mechanism of Bacteriostasis.**—*J. exp. Med.* **75.** 369–381. **435**

WOOD, W. B., Jr., & AUSTRIAN, R. (1942). **Studies on the Antibacterial Action of the Sulfonamide Drugs. II. The Possible Relation of Drug Activity to Substances Other Than *p*-Aminobenzoic Acid.**—*Ibid.* 383–394. **436**

I. *p*-aminobenzoic acid was shown to nullify the bacteriostatic action of six sulphonamides studied (sulphanilamide, sulphapyridine, sulphathiazole, sulphadiazine, sulphaguanadine, and diamino diphenylsulphone). The bacteriostatic potency of each of these sulphonamides was found to be directly proportional to its ability to counteract the antibacteriostatic action of *p*-aminobenzoic acid. In the case of each drug tested over a wide range of concentrations, the minimum amount of *p*-aminobenzoic acid needed to prevent bacteriostasis was such that the ratio *p*-aminobenzoic acid to drug was constant. These results support the theory that the sulphonamides exert their bacteriostatic action by competing with the essential metabolite, *p*-aminobenzoic acid, for an important enzyme site in the bacterial cell.

II. In cultures of *Staphylococcus aureus* in a synthetic medium, nicotinamide and cozymase (which both contain a pyridine group) were shown to block the bacteriostatic action of chemically unrelated sulphonamides (sulphanilamide and sulphathiazole) as well as the chemically related compound sulphapyridine. The antibacterial properties of organic dyes totally unrelated to the sulphonamides (methylene blue and thionine) were also nullified by the addition of cozymase to the culture medium. The anti-drug effects of nicotinamide and cozymase in staphylococcus cultures were observed to be directly proportional to their ability to stimulate the growth of the organism in the synthetic medium. When tested in cultures of *Bacterium coli* in which they failed to accelerate bacterial growth, these substances failed to influence the bacteriostatic action of the sulphonamides. These observations do not support the theory that sulphapyridine, sulphathiazole, and sulphadiazine prevent bacterial growth by interfering with the functioning of the chemically related coenzymes, cozymase and cocarboxylase.—J. M. ROBSON.

MAGRINI, C. (1941). Un nuovo antidoto del tartaro emetico. **[A New Antidote for Tartar Emetic].**—*Boll. Soc. ital. Biol. Sper.* **16.** 759–761. **437**

Following the observation that the toxicity of fouadin (a tervalent antimony compound of pyrocatechol sodium disulphonate) is reduced if the drug is injected with an excess of sodium pyrocatechol disulphonate, the influence of this compound on the toxicity of tartar emetic was investigated by the intravenous injection of lethal doses of tartar emetic intravenously into g. pigs, followed immediately by the intravenous injection of the maximum tolerated dose of sodium pyrocatechol disulphonate (2 g. per kg.). The minimum lethal dose [M.L.D.] of tartar emetic was found to vary between 0·015 g. per kg., corresponding to 0·0054 g. of antimony per kg., and 0·02 g. per kg., corresponding to 0·0072 g. of antimony, an average M.L.D. being taken as 0·006 g. of antimony per kg. When the antimony injection was followed immediately by sodium pyrocatechol disulphonate the M.L.D. was raised to 0·10 g. of tartar emetic per kg. which contains 0·036 g. of antimony. It is suggested that the injection of the two drugs leads to the formation of fouadin in the body. The M.L.D. per kg. of fouadin contains 0·029 g. of antimony, but the toxicity may be decreased by excess of sodium pyrocatechol disulphonate.—U. F. RICHARDSON.

NAGEL, A. (1942). Ueber die bakterizide Wirkung des Targesins auf Diphtherie-, Pseudodiphtherie- und verschieden virulente Tuberkelbazillen. **[Bactericidal Action of Targesin on Diphtheria, Pseudo-Diphtheria and Tubercle Bacilli].**—*Zbl. Bakt. I.* (*Orig.*). **149.** 111–121. **438**

Targesin is a colloidal diacetyl-tannin-silver-protein compound. In a 10 or 15% solution it has a strong bactericidal action on diphtheria bacilli. Pseudo-diphtheria bacilli and tubercle bacilli are very resistant to targesin.—H. BLASCHKO.

I. SCHRÖER, W. (1942). Chemo- und Serumtherapie in ihrer Einwirkung auf die histologischen und bakterioskopischen Befunde bei der Infektion mit Gasödemerregern im Tierversuch. **[Effect of Chemo- and Serotherapy on the Histological and Bacteriological Findings in Experimental Gas Gangrene].**—*Zbl. Bakt. I.* (*Orig.*). **149.** 1–14. **439**

II. KLOSE, F., & SCHRÖER, W. (1942). Chemo- und Serumtherapie bei der Infektion mit Gasödemerregern im Tierversuch. **[Chemo- and Serotherapy of Experimental Gas Gangrene].**—*Ibid.* 15–25. **440**

I. Gas gangrene produced by intramuscular inoculation of *Clostridium welchii* into g. pigs was in no way affected by treatment with mesudin [see also SCHOOP *et al.*—*V. B.* **11.** 798]. Similar infection by *Cl. oedematiens* was treated by antiserum with indications of increased resistance of the animal.

II. The authors' experiments indicate that mesudin is active against gas gangrene infection in mice, though serum treatment gave better results. Only slight activity was shown against *Cl. welchii* infection in g. pigs by mesudin, though serum treatment was adequate, while mesudin was valueless in the case of *Cl. septicum* infection in this animal. The infective material in these experiments was suspended in 5% mucin. When saline was used instead, the action of mesudin in g. pigs was more marked, but the authors are very critical of DOMAGK & HEGLER'S [*V. B.* **12.** 395.] recommendations for its use in prophylaxis.

—J. G. CARR.

DUBOIS, A., & KOHN, I. (1940). Infectiosité de trypanosomes au cours de traitements chimiothérapiques. **[Infectivity of Trypanosomes during Chemotherapy of the Host].**—*Ann. Soc. belge Méd. trop.* **20.** 173–178. [Flemish summary]. **441**

The authors previously found [*V. B.* **10.** 793.] that trypanosomes obtained from infected mice soon after treatment with neosalvarsan were non-infective, although appearing to be normally alive under the microscope. They report here the results of similar experiments with other drugs. Bayer 205 and "novoflavine" had the same effect as neosalvarsan, but with tryparsamide, tartar emetic, and human serum, the trypanosomes lost their infectivity with their life and not appreciably sooner.—J. E.

FISHER, H., INKSTER, C., & BIELY, J. (1942). **Ineffectiveness of Cow Urine in the Control of Eimeria**

Tenella Infection in Chickens.—*Amer. J. vet. Res.* **3.** 221–224. 442

This investigation was undertaken in response to requests from commercial poultry farmers, because of claims that dosage of poultry with cow urine diminishes losses from coccidiosis. Chickens were given drinking water containing various amounts of cow urine over long periods and no permanent harm was observed. To determine the effect of urine on the virulence of coccidiosis, chickens were fed 25, 50 and 75% of urine in the drinking water. At the end of one week all the birds were fed 120,000 sporulated oocysts. The results obtained indicated that urine lowered the birds' resistance to coccidiosis. It is concluded that cow urine, various fractions of urine, and urea gave no protection to growing chickens which had received lethal doses of *E. tenella*.—C. Horton Smith.

Herrick, C. A., Holmes, C. E., & Degiusti, D. L. (1942). **The Experimental Use of Organic Sulfur Compounds for the Prevention of Cecal Coccidiosis in Chickens.**—*Amer. J. vet. Res.* **3.** 117–127. 443

A number of sulphur compounds was examined with a view to establishing their value as coccidiostatic agents. Oocysts and compounds were fed by means of graduated pipettes. Autopsy of surviving chickens was carried out on the ninth day and the severity of the infections was noted. Preliminary experiments showed that of the 11 compounds studied, dodecyl thiocyanate, "lorol" thiocyanate, tetra-ethylthiuram monosulphide, and a water emulsion containing 25% tetra-ethylthiuram monosulphide with 25% coconut oil as internal phase were relatively non-toxic to chickens and afforded some protection from coccidiosis. "Lorol" thiocyanate and tetra-ethylthiuram monosulphide in single doses prevented caecal coccidiosis. The water emulsion was effective only in large doses which approximated to the toxic limit. When "lorol" thiocyanate and tetra-ethylthiuram monosulphide were fed continuously the results were unsatisfactory. Tetra-ethylthiuram monosulphide was used in an attempt to regulate the degree of initial infection and so to produce resistance to subsequent infections. The results appeared promising and may form the basis for further work.—C. Horton Smith.

Fulton, J. D. (1942). **Attempts to Prepare in Fowls a Strain of *Plasmodium gallinaceum* Resistant to Plasmoquine.**—*Ann. trop. Med. Parasit.* **36.** 75–81. 444

Fulton & Yorke (1941) have previously shown that a strain of *P. knowlesi* in *Macacus rhesus* could, after short treatment, be made resistant to plasmoquine. The present paper describes an attempt to prepare in fowls a strain of *P. gallinaceum* resistant to the same drug. Thirty-three passages were made by blood inoculation with the plasmoquine-treated strain over a period of 15½ months, during which 472·5 mg. of drug were given per kg. body weight. The amount of drug given at each passage lay between 2 mg. per kg. and 20–30 mg. per kg. No resistance developed as a result of this or as a result of an intensive course of treatment with a total of 180–184 mg. during seven passages.—C. Horton Smith.

Thomssen, E. G., & Doner, M. H. (1942). **Attractants and Repellents for Insects. Part I. Part II.**—*Soap.* **18.** No. 4. 97–99 and 105. No. 5. 95–96 and 105. 445

The problem of curtailing insect pests is one of growing importance, since not only are known pests increasing in density and distribution, but new destructive species are continually cropping up in different sections of the U.S.A.

Part I summarizes the work on the attraction of insects by chemical compounds, a subject of considerable interest, since it has a bearing on the control of a number of important insect pests. The authors point out that much more work requires to be done before this phase of chemical control can be fully utilized.

Part II summarizes the work upon repellents, a field in which successful developments are proceeding. Unfortunately, owing to the difficulties involved in relating chemical constitution to insecticidal activity, much of this research must be conducted by the method of trial and error.—W. Moore.

Searls, E. M. (1942). **All-Purpose Insect Spray. Some Considerations in Favor of a Single Type Fly Spray for Home, Institutional, and Stock Spray Purposes.**—*Soap.* **18.** No. 5. 98–101. 446

At the present time three types of oil-base sprays are generally recognized, those for cattle flies, for crawling insects, and for household flies. In order to overcome this multiplicity of somewhat similar materials, it is suggested that an odourless type A.A. grade spray made with a highly refined oil base within the distillation range of kerosene, could be used under all conditions where oil-base sprays are now used. [Details of this spray are given in *Blue Book, 1941.* pp. 187–188. Suppl. to *Soap.* New York: MacNair-Dorland Company.]—W. Moore.

Shaw, A. O. (1942). **What a Cowman Expects of a Cowspray.**—*Soap.* **18.** No. 2. 90–93. 447

The article deals with the value of sprays to protect cattle when badly troubled by house and stable flies. —W. Moore.

*Schieren, J. (1941). Vergleichende Versuche zur Läusebekämpfung beim Pferd mit Nikotin-Eisessig, grauer Salbe und dem Derristrockenpräparat "Malix". [**Comparative Trials of Nicotine with Glacial Acetic Acid, "Grey Mercurial Ointment", and Derris Powder against Lice on Horses**].—*Inaug. Diss., Hanover.* [Abst. from abst in *Dtsch. tierärztl. Wschr.* **50.** 113]. 448

All three preparations gave comparable results when tested on 110 horses. In each case it was advisable to apply treatment three times at ten-day intervals. There is a risk of poisoning with the nicotine mixture, and "grey ointment" [? calomel ointment] was therefore preferred. The derris preparation was harmless to animals and man, but rather slow in its action on the lice and relatively expensive.

Jennings, S. (1942). **The Treatment of Mange by Tetraethylthiuram Monosulphide.**—*Vet. Rec.* **54.** 330–331. 449

A 2% aqueous emulsion of tetra-ethylthiuram monosulphide gave a relatively rapid cure of both sarcoptic and demodectic mange in dogs and of a case of equine chorioptic mange, while one dressing of a 1·25% emulsion cured eight cases of typical "neck mange" [sarcoptic] in cattle.

The preparation is stated to be non-toxic, has no objectionable smell, and does not appear to irritate the skin.—W. Moore.

Percival, G. H. (1942). **The Cure of Scabies, and a New Remedy.**—*Brit. med. J.* Oct. 17th. 451–452. 450

Tetra-ethylthiuram monosulphide, the new remedy quoted in this paper, cured 50 consecutive cases of human scabies when it was used in the form of a liquid preparation containing 5% of the drug. A small number of cases treated with a 0·25% solution, and a few treated with a paste made from the powdered drug and water yielded unsatisfactory results. The solution used was made by diluting an emulsifiable oily mixture

having the composition :– tetra-ethylthiuram monosulphide 25%, polyglycerol ricinoleate 10%, and industrial methylated spirit 65%. This preparation remains stable at room temperature, but tends to crystallize out if kept at a lower temperature ; it can be redissolved by gentle heat. Immediately before use, one part of this mixture was added to four parts of water : the diluted emulsion separates on standing and cannot be redispersed, and therefore it must be diluted only as needed. It was rubbed over the body twice daily for three days. P. suggests that the drug is worthy of more extended trials in acarine infections because (a) there is no reason to anticipate a shortage of supply, (b) the drug is cheap, and (c) it economizes in fats and oils. The first clinical trials of tetra-ethylthiuram monosulphide in this country were those of JENNINGS [see preceding abst.] who used it successfully against mange in dogs, cattle, and a horse.—D. G. D.

I. WITTMANN. (1942). Die "Hauptner"-Räudegaszelle während des russischen Winters. **[The Hauptner Mange Gas Cell During the Russian Winter].**—*Z. Veterinärk.* **54.** 129–135. **451**

II. LAPPE. (1942). Praktische Erfahrungen in der Räudebehandlung im Winter 1940/41. **[Experiences in Equine Mange Control in the Winter of 1940-41].**—*Ibid.* 135–137. **452**

I. Difficulties were met with in the operation of the Hauptner gas cell under winter conditions in Russia. With an outside temperature averaging –25°C. the gas cell had to be erected inside a shed. Even then it proved difficult to maintain the requisite temperature, and W. describes an improvised method whereby hot air was led from an oven by a tube passing into the cell ventilators. The necessity for housing the gas cell made it important to prevent small leaks of the sulphur dioxide, which had been unimportant when the gas cell was out-of-doors. Leakage was prevented in this instance by fastening down over the cheeks of the horse a pad stuffed with cotton wool with holes for the ears, and attaching this to the sleeve through which the horse's head protruded from the gas cell. It was an advantage to ensure that the horses were hungry when placed in the cell ; they would then feed quietly from a narrow trough placed in such a way as to minimize lateral movement of the head.

II. Mange in horses was not much in evidence during the first year of the present war ; in the second year, however, it was a serious problem, though not on the scale met with in the war of 1914–18.

L. advocates the solidly built twin gas cell on the grounds of economy of space and material. Direct electrical heating of the cell was found useful. It was considered that the cell temperature should reach 18°C. but should not exceed 20°C., or sweating occurred and the patient was restless. It was essential to clip thick or matted hair, even in cold weather ; in thin-haired horses clipping was limited to the mane and the root of the tail. Derris preparations, odylen, and 10% naphthol ointment were all found useful in treating the head. Treatment of visible lesions by rubbing in a mixture of liquid paraffin and suet, or horse fat was a useful adjunct to the gas-cell treatment and accelerated recovery.

For diagnosis, the soaking of skin scrapings for 3–5 hours in caustic potash is recommended. When the lesions have already been treated it is necessary to boil skin scrapings with potash and then centrifuge. It was found, however, that the heat of a sun-ray lamp on the lesion before the scraping was taken, and on the material removed, stimulated activity in the mites which could then be detected with a hand lens.
—H. E. HARBOUR.

SCHMID, F. (1942). Zur Behandlung des Wurmbefalles unserer Haustiere. **[Treatment of Helminthiasis in Domestic Animals].**—*Berl. Münch. tierärztl. Wschr.* Aug. 21st. 249–252. **453**

An advisory article for the practising veterinarian, with no new information.—H. E. HARBOUR.

HABERMANN, R. T., HARWOOD, P. D., & HUNT, W. H. (1941). **Critical Tests with Phenothiazine as an Anthelmintic in Horses.**—*N. Amer. Vet.* **22.** 85–92. **454**

Critical tests using crude, commercial, unconditioned phenothiazine were conducted on nine aged horses and one mule. The drug was administered either in gelatin capsules or mixed with the feed. At the end of the experiment, all animals were examined P.M. for pathological changes which may have been caused by the drug, and the contents and walls of the gastro-intestinal tract were examined for helminths. The results showed that doses of phenothiazine ranging from 50–100 g. removed more than 99% of a total of 362,797 cylicostomes, 96% of 137 *Strongylus* spp., 28% of 25 *Oxyuris*, and 72% of 40 *Parascaris equorum*. These results indicate that phenothiazine is more effective for the removal of cylicostomes than of *Strongylus* spp., but that the drug was ineffective for the removal of *Oxyuris* and of bots which were found at P.M. examination to be present in many of the horses ; two horses were also infected with *Habronema muscae* against which the drug was ineffective.

Toxicity tests were carried out on five horses, three of which exhibited no significant symptoms after administration of 500 g. phenothiazine ; a second dose of 500 g., 43 days after the first dose, also failed to produce any significant symptoms in one of these animals. The other two horses were given doses of 1,000 g. each, which proved fatal. The changes found at autopsy are described.

The therapeutic dose recommended by the authors is 50 g. per equine animal, which they consider to be more effective and quite as safe as the dose of 30–40 g. recommended by TAYLOR & SANDERSON [see *V. B.* **11.** 400]. Observations reported by others on the toxicity and effectiveness of the drug are discussed and methods of administering phenothiazine by capsule, by stomach tube, or by mixing with the food are described.—R. A.

HARSHFIELD, G. S., & WATSON, I. (1941). **Test of Drenching Feedlot Lambs Continued This Year ; Last Year's Results Described.**—*Colo. Farm Bull.* **3.** No. 4. 10–12. **455**

Two groups, each of 22 lambs, were dosed with phenothiazine and copper sulphate + nicotine sulphate respectively, while a similar third group was left untreated. The dose of phenothiazine used was ½ g. per lb. body weight. [Double this dose would probably have been more effective.] After 16 weeks, the lambs were slaughtered and worm counts were made from four lambs in each group. The results, in general, indicated a definite reduction in parasites in the treated groups. [It is doubtful whether the reductions can be regarded as significant in view of the fairly wide variation within these small samples.] Comparison of the three groups showed that the profit per lamb was 14 cents greater in the phenothiazine-treated than in the other two groups, between which there was little difference in profit. The authors draw no conclusions as the experiment is being continued for a further year.
—H. E. HARBOUR.

*SPITALER, W. (1941). Über die Entmischung von Farbstoffgemischen durch die gesunde und vergiftete Niere. **[Differential Filtration of Dye Mixtures by Healthy and Diseased Kidneys].**—*Inaug. Diss.*,

Hanover. [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50**. 270]. **456**

In experiments on the excretion of dye mixtures by frog kidneys it was shown that there is a difference between the excretions of the tubules and glomeruli. Kidney lesions affecting mainly the excretory part of the tubules can be recognized by a change in the excretion of the dye mixture. The conclusions made during the investigations on frog kidneys were confirmed by experiments on healthy horses which were given intravenous injections of dyestuffs. Lipoid-insoluble "tubular" dyes, "ponceau 2R", and "palatine-scarlet A", and "glomerular" dyes such as "cyanol", "patent-blue V" and "eriocyanin A" were quite effective for these excretion experiments. The presence and severity of kidney functions may be detected by the differential filtration of dye mixtures.—E. R. P.

FEDOTOV, A. I. (1940). Insulinaterapiya pri paralitícheskoĭ hemoglobinemii loschadeĭ. [**Insulin Treatment of Paralytic Haemoglobinuria in Horses**].—*Sovyet. Vet.* No. 6. pp. 36–39. **457**

Affected horses of different ages and weight were examined and detailed histories of their illness recorded. A pronounced hyperglycemia was observed during paralytic haemoglobinuria, blood sugar values varying from 160–267 mg. %; the blood alkaline-reserve values decreased, varying between 410mg.% and 330mg.% [Expressed in this manner in the article.—ED.]

Administration of 500–600 international clinical units of insulin gave good results for horses of average weight. Larger doses (900 I.C.U.) caused marked unrest, the animal beginning to stamp and move the head etc.; normal behaviour was restored when 20 ml. of 1% glucose solution were administered. Intravenous injection of 200–300 I.C.U. of insulin caused a rapid fall in the blood sugar level and an increase of the alkaline reserve.—E. R. PARISER.

KISLYKH, A. I. (1939). Znachenie atsidofil'noĭ prostokvashi. [**Acidophilin as a Prophylactic and Curative Agent for Piglets**].—*Sborn. Rabot chelyabinsk. sel'skokhoz. opyt. Stant.* **1**. No. 2. 173–182. Chelyabinsk. **458**

K. claims that *Lactobacillus acidophilus* is useful for the cure of white scours and allied conditions in calves and similar conditions in pigs.—A. MOLDAWSKY.

CRUICKSHANK, J. C., HOBBS, B. C., MCFARLAN, A. M., & MAIER, I. (1942). **The Disinfectant Action of Phenol and of Alcohol in T.A.B.C. Vaccine.**—*Brit. med. J.* Aug. 15th. 182–183. **459**

Alcohol concentrations of 25% and 22·5% were compared with 0·5% phenol for the destruction of contaminants in T.A.B.C. vaccine for enteric prophylaxis. Recovery of added *Staphylococcus aureus*, *Bacterium coli*, *Pseudomonas pyocyanea*, and spores of *Bacillus subtilis* and *Clostridium sporogenes* was tested by plating technique. The spores were unaffected, but the three nonsporulating bacteria were destroyed within a few hours, effectiveness being in the order of 25% alcohol, 0·5% phenol, and 22·5% alcohol. There is therefore no reason to doubt the efficacy of 22·5% alcohol in Felix's new vaccine.—J. P. GARDNER.

HIRSCH, M. M., & NOVAK, M. V. (1942). **Evaluation of Germicides with Relation to Tissue Toxicity.**—*Proc. Soc. exp. Biol., N.Y.* **50**. 376–379. **460**

The toxicity index was taken as toxicity end point/germicidal end point. The toxicity end point was the dilution of antiseptic completely inhibiting phagocytosis, while the germicidal end point was the dilution completely killing the test organism (a strain of *Staphylococcus albus* isolated from the air) in the presence of blood. The results, as far as they are of significance, indicate that in general the chlorine compounds rate the highest, phenolic compounds next, and organic mecurials the lowest as efficient germicides. Tincture preparations in general are not ideal germicides since the solvents are more toxic to phagocytosis than to bacteria.—J. M. ROBSON.

SALLE, A. J., & KORZENOVSKY, M. (1942). **Effect of a Vacuum on Destruction of Bacteria by Germicides.**—*Proc. Soc. exp. Biol., N.Y.* **50**. 12–16. **461**

Of the insecticidal gases investigated, *viz*, formaldehyde, methyl bromide, methyl formate, ethylene oxide, and carbon dioxide, only the first was found to have a sufficiently rapid germicidal action to warrant further attention. Test material consisted of culture droplets of such organisms as streptococci, staphylococci, the typhoid bacillus, *Bacillus subtilis* and *B. anthracis* absorbed on dental cotton rolls and dried at 37°C. for three hours. 25 min.'s exposure to formaldehyde vapour at a pressure reduced to 2 inches of mercury was sufficient to completely sterilize the rolls, while two hours' exposure to the same concentration at normal atmospheric pressure did not kill the majority of the organisms.

The method is held to be very useful for the sterilization of objects likely to be injured by dry or most heat. A diagram and description of the vacuum sterilizer is included in the text.—J. LOCHIEL MCGIRR.

TWORT, C. C., & BAKER, A. H. (1942). **Further Researches on Bactericidal Mists and Smokes.**—*J. Hyg., Camb.* **42**. 266–283. **462**

Of a number of phenolic compounds tested for their efficiency as germicidal aerosols, resorcinol and hexyl resorcinol were found to be the most suitable and yet free from deleterious effects. Hexyl resorcinol in aerosol form is more persistent and effective in weaker concentration than resorcinol, although its germicidal activity is slower. "Mists" of these phenols can be suitably generated by hot plate methods or by a mechanical atomiser. NaOCl was a powerful germicide in aerosol form but gave disappointing results when the mist was produced from a hand sprayer. Of the bacteria studied, atomized emulsions of acid-fast bacteria proved to be much more resistant to aerosol-formed phenolic germicides than those of *Neisseria catarrhalis* and a Gram-positive saprophytic micrococcus and somewhat more resistant than emulsions of *Corynebacterium xerosis* and *Streptococcus agalactiae*.

The choice of solvent is more important when the phenolic mixture is to be mechanically atomized than when volatilized by the hot plate method; generally speaking the use of solvents tends to depress rather than enhance germicidal action. Accessory mists and smokes have comparatively little effect in interfering with the action of the primary germicidal aerosols. The presence of saliva in the bacterial particles adversely affected the action of hexyl resorcinol; bacteria suspended in saliva-water (as compared with broth) appeared to be more sensitive to resorcinol, but the lethal activity of most other phenols was not much affected.

A relative humidity of the atmosphere of 60% appeared to be optimum for the lethal effectiveness to bacteria of germicidal aerosols; at 50% the efficiency markedly declines and at 30% or less the germicidal effect is practically negligible even in relatively high concentrations of the germicide.—ALFRED EDEN.

FINN, S. R., & POWELL, E. O. (1941–42). **The Chemical and Physical Investigation of Germicidal Aerosols. I. Germicidal Smokes. II. The Aerosol Centrifuge.**—*J. Hyg., Camb.* **41**. 473–488, and **42**. 354–364. **463**

I. Smokes produced by heating balsam of Peru and incense and by smouldering cardboard were

examined by the aid of the ultramicroscope, and their particle sizes determined by measuring the rates of fall under gravity. Their evaporation rates were also measured. The particle sizes appeared to be very heterogeneous, varying, for incense smokes for example, from less than 0·3 to 1μ. The radii of very small particles have been estimated by measurements of their Brownian movements. By comparison of the results of these estimations with bacteriological findings, the germicidal activity of these smokes appears to be closely linked up with the smaller particles and the less volatile constituents.

The evaporation rates of a number of pure substances related to balsam of Peru have been determined; these include vanillin, benzoic and cinnamic acids, benzyl cinnamate, and benzyl benzoate. Some discussion is devoted to the surprisingly low figure for cinnamic acid.

II. A description is given of the principle of the aerosol centrifuge, with a comprehensive mathematical exposition. Three forms of centrifuge whose construction is described were used for experimental purposes, and the relations between the behaviour of the centrifuge and its dimensions, speed, and airflow were experimentally tested on these machines. These showed that the derived mathematical formulae formed an adequate basis for design. Some mention is made of the various applications of the aerosol centrifuge.—ALFRED EDEN.

FISHER, C. V. (1942). **Influence of Wetting Agents on Various Antiseptics.**—*Amer. J. publ. Hlth.* **32.** 389–394. **464**

The phenol coefficient method was employed to test the effects of addition of various commercial synthetic detergents—of the anionic, cationic, and neutral types—to various well known antiseptics. The test organisms employed were *Salmonella typhi* and *Staphylococcus aureus*, and the tests were carried out at varying pH. It was found that addition of the wetting agents in dilutions of 1 : 1,000 considerably enhanced the germicidal activity of $HgCl_2$, Hg oxycyanide, chloramine T, argyrol, and potassium permanganate, but no significant increase occurred when the same wetting agents were added to phenol, cresol, and tincture of iodine. No single wetting agent could be depended upon to increase the germicidal activity of all types of antiseptics.

While pH plays an important role in the activity of antiseptics, the choice of a wetting agent added to any given antiseptic must be determined on the basis of practicability and compatability. It is suggested that the use of wetting agents offers great possibilities in increasing the activity of known bactericidal compounds.—ALFRED EDEN.

SCHNEIDER, R. (1942). Irgamid in der Wundbehandlung. **[Irgamid in Wound Treatment].**—*Schweiz. Arch. Tierheilk.* **84.** 314–317. **465**

Irgamid is a new sulphonamide preparation. S. has used it externally in the form of a powder or of an ointment for the treatment of suppurating wounds. A description is given of two cases in mules and one in an army horse where the treatment was successful.—H. B.

HODGSON, A. R., & ROBINSON, J. R. (1942). **Absorption of Sulphanilamide Applied Locally. Blood Levels in 41 Cases.**—*Lancet.* **243.** 392–394. **466**

In 41 cases of traumatic and surgical wounds packed with sulphanilamide powder, blood concentrations reached about 1 mg. per 100 ml. for each gram of the drug used in a period of 16–30 hours after operation. The peak concentration of the blood corresponded to the approximate time of disappearance of solid sulphanilamide from the wound. In many cases, local application alone will maintain an adequate therapeutic concentration in the blood, and indeed care may be needed to obviate toxic effects.—J. P. GARDNER.

See also absts. **404** (Antirachitis), **428, 429** (Anthelmintic), **377** (Hormone Therapy).

HYGIENE AND PUBLIC HEALTH

*BAER, H. (1942). Die Untersuchung der Milch Proben auf Tuberkulose. **[The Examination of Milk Samples for TB.].**—*Schweiz. Milchztg.* No. 2. [Abst. from abst. in *Z. Fleisch- u. Milchhyg.* **52.** 129]. **467**

Statistics supplied by veterinary surgeons in the province of Zurich show that of 3,600 single milk samples, 5% contained *Mycobacterium tuberculosis*, which was also present in 1% of samples from dairy farms.—O. D. JAMES.

MEYER, R. (1941). Das Wesen der Fleischvergiftungen und die in den letzten 20 Jahren beobachteten Wandlungen in ihrem Auftreten an Hand der amtlichen Statistik. **[The Nature of Meat Poisoning and Changes in Occurrence Observed in the Last Twenty Years According to Official Statistics].**—*Berl. Münch. tierärztl. Wschr.* Oct. 3rd. 477–482. Oct. 10th. 492–495. **468**

A valuable analysis of statistics concerning outbreaks of meat poisoning in Germany during 1922–39. The term " meat poisoning " is intended to include both illness caused by the consumption of flesh from diseased animals and poisoning by meat of healthy animals which has been contaminated P.M.

Various kinds of meat caused poisoning in the following order of frequency :– beef, pork, horse flesh, veal, mutton, and goat flesh. The first two are frequently consumed in the raw state in Germany. In addition, sausages were responsible for a large number of outbreaks.

A very considerable number of cases (as much as 50–70% of those caused by beef or horse flesh) could be traced to the eating of meat from animals killed by emergency slaughter. In recent years these figures have dropped appreciably as a result of the compulsory bacteriological examination of such meat. A similar drop could be observed in the number of cases of poisoning due to the consumption of minced meat. Here, too, the decline in the number of cases followed the introduction of more stringent laws regulating the production and sale of that foodstuff. Again, since a law was passed subjecting farm-killed meat to compulsory meat inspection, the number of poisoning cases traceable to such meat has markedly declined.

The bacteriological findings underwent a significant change during the period under review. In 1923 *Salmonella paratyphi-B* was found in 86% of cases, *S. enteritidis* in 12%, and *S. typhi-murium* in 2%. These figures in 1937 had changed to 3%, 15%, and 70% respectively. This reversion in the proportions of the causal organisms reflects not so much an alteration in the nature of the outbreaks, as an improvement in bacteriological methods and a consequently greater accuracy in diagnosis.

Cases of botulism have increased in frequency during recent years. In most instances pork, ham, or sausages were the sources of infection. Botulism was responsible for nearly 25% of all deaths caused by meat poisoning.

Several cases of fish poisoning due to salmonella infection occurred. In every instance the fish flesh had

become infected P.M. In contradistinction, a number of cases of food poisoning, due to infection of the individuals from which the flesh and eggs were obtained, were recorded following the consumption of flesh and eggs from waterfowl, especially duck eggs.

In conclusion the epidemiology of meat poisoning is discussed, special stress being laid on the significance of environmental factors with regard to the nature and course of an outbreak.—M. LANDAU.

*SCHEUERLEN, W. (1941). Ueber eine umfangreiche bakterielle Lebensmittelvergiftung durch Enteneier. **[A Large Outbreak of Food Poisoning from Duck Eggs]**.—*Veröff. Volksgesunsdheitsdienst.* **55.** 189. [Abst. from abst. in *Z. Fleisch- u. Milchhyg.* **52.** 116]. **469**

A hundred persons who had partaken of chocolate pudding and vanilla sauce at a dinner in June, developed typical symptoms of food poisoning within 8–12 hours. There were two fatal cases, the remainder recovering after at least 14 days' illness. Those who refrained from the above food remained well.

Salmonella enteritidis and *S. typhi-murium* were isolated both from 23 duck eggs of the same batch as those used in the pudding, and from the faeces of the infected persons.

It was demonstrated that the infection was transmitted *via* the cook's fingers from the previously used duck eggs to hen eggs used in the sauce.

The occurrence appears to indicate that the Duck Egg Regulations of 1936 do not provide adequate protection against this source of infection.—O. D. JAMES.

See also absts. **285, 301, 311, 393, 494** (Meat Inspection). **495, 496.**

TECHNIQUE AND APPARATUS

WILLIAMS, J. W. (1939). **Growth of Microorganisms in Shake Cultures under Increased Oxygen and Carbon Dioxide Tensions.**—*Growth.* **3.** 21–33. **470**

Characteristic sub-surface bands of growth, previously designated "bacterial growth spectra", were observable in bacterial shake cultures grown under increased gas tensions. The depth below the surface of such growth increased with rise in O_2 tension (3–160 lb.), but the density, type and width of the bands was constant. On the other hand, the density and width of the growth bands varied directly with CO_2 pressure (0–100 lb.) though, within limits, the upper band was also depressed. The influence of temperature of incubation, number of organisms planted, amount of nutrient, reducing and oxidizing agents, and growth-inhibiting factors upon the above phenomena were also studied. A theoretical explanation of the effects observed and a possible correlation with some of the phenomena of inanimate colloidal chemistry is discussed.

The organisms used included *Salmonella enteritidis*, *Bacillus anthracis*, *B. mycoides*, *B. megatherium*, *Bacterium coli*, *Pseudomonas aeruginosa*, *Staphylococcus albus*, *Staph. aureus*, and *Proteus vulgaris*.—J. LOCHIEL MCGIRR.

ZOTTNER, G. (1942). Contribution à l'étude de l'isolement de Brucella abortus en CO_2 pur. **[The Isolation of *Br. abortus* in Pure Carbon Dioxide]**.—*C. R. Soc. Biol. Paris.* **136.** 369–370. **471**

Z. found that CO_2-sensitive strains of *Br. abortus* grew equally readily in concentrations of 10% and 100% of CO_2. He describes his method and apparatus in detail.—J. LOCHIEL MCGIRR.

EDWARD, D. G. ff., & VAN DEN ENDE, M. (1942). **A Simple Mechanical Method for Obtaining Uniform Bacterial Suspensions.**—*J. Path. Bact.* **54.** 386–391. **472**

A mechanical method is described for breaking up chains and clumps of organisms such as streptococci into single organisms and for rendering persistently granular bacterial suspensions homogenous. The apparatus consists of an atomiser made by boring a rod of Perspex, (a transparent plastic which can be worked on a lathe) and of a trap to catch large droplets which are shown to consist of single cocci. Smaller droplets and mist are trapped in a series of antiseptic traps containing 5% lysol and 1% hexyl resorcinol in 50% spirit or in a furnace trap consisting of a heated metal spiral. The atomiser must be disinfected by immersing in hypochlorite, as lysol and carbolic acid damage the Perspex and mercurials attack the brass.

Mention is made of certain technical procedures where the method might be helpful.—M. H. KYAW.

EGLI, H. (1942). Der Nachweis von Tuberkelbazillen im direkten Ausstrich gefarbt nach Osol betrachtet in Dunkelfeld als Methode der Wahl. **[Dark-Ground Observation of Tubercle Bacilli in a Direct Smear Stained by Osol's Technique as Method of Choice]**.—*Schweiz. med. Wschr.* No. 6. p. 161. [Abst. in *Tubercle, Lond.* **23.** 193. Copied *verbatim*]. **473**

Egli's conclusions are as follows: (1) The fluorescence method for examination of tubercle bacilli which is costly, relatively difficult and therefore only suitable for scientific institutes is not superior to Osol's dark field method but is of equal value. (2) Osol's dark field method is six times superior to the ordinary Ziehl-Neelsen method in demonstrating tubercle bacilli and saving of time. (3) The dark field arrangement requires little apparatus, is about ten times cheaper than the fluorescence method, and is easy to manage. (4) Osol's stain is as similar to and as simple as the Ziehl-Neelsen stain.

COOKE, J. V., & BLATTNER, R. J. (1942). **Trypan-Blue Vital Staining in Studies of Virus Lesions on Chorio-Allantoic Membranes.**—*Amer. J. Path.* **18.** 163–167. **474**

An article giving further details of a method already described [see *V. B.* **10.** 884].—J. FRANCIS.

DOBELL, C. (1942). **Some New Methods for Studying Intestinal Amoebae and other Protozoa.**—*Parasitology.* **34.** 101–112. **475**

Intestinal amoebae cultivated by the Boeck-Drbholav technique are difficult to fix and stain satisfactorily at certain stages of development. They usually become rounded and are grossly contaminated with bacteria. D.'s method enables permanent preparations to be made which preserve amoebae at all stages of development in their natural attitudes with extended pseudopodia. The method is a modification of the old one for dealing with infusions, where coverglasses were laid on the bottom of the culture vessel or on the surface film and the organisms which crept on to these glass slips could then be removed and the attached organisms fixed *in situ*. D.'s modification makes it possible to carry out the whole process of preservation of a Boeck-Drbholav culture aseptically and at ordinary room temperature. The new method is described in detail and there are also descriptions of two new staining methods which are similar to, but simpler than, the "iron haematoxylin" methods of Heidenhain and others. The principal difference lies with the substitution of tungsten or molybdenum for iron as a mordanting agent. Excellent results have been obtained with them.—C. HORTON SMITH.

SEDLMEIER, H. (1942). Die Züchtung von Trichomonas fetus auf festem Nährboden. [**Culture of *T. foetus* on a Solid Medium**].—*Berl. Münch. tierärztl. Wschr.* Aug. 7th. 240–242. **476**

A method is described of growing trichomonads on a solid medium, consisting of a mixture of equal quantities of glucose agar and peptone broth to which an equal quantity of horse serum has been added. Best growth is obtained when the medium is semi-solid. It is recommended to place petri dishes of the medium in the refrigerator for 2–3 hours before inoculating. One half of the plate is sown with *Chromobacterium prodigiosum* and the other half with trichomonad material, and incubation is carried out at 37°C. Within a few hours, single trichomonads or small groups of these organisms can be seen wandering from the neighbourhood of the inoculation points. On the following day, the beginning of growth can be seen under a lens. Optimal growth is reached in 4–5 days.

In young colonies, the size of the organisms is relatively constant but occasional giant forms are seen. In older colonies, round and polygonal forms occur. The colonies die off and movement ceases in 8–12 days. No encysted forms have been detected.

Cultivation is said to be successful with any material reasonably free from contamination, but has not been successful with material from the preputial sac of bulls. The method can be used to free cultures from such contaminants as corynebacteria.—U. F. R.

DESCHIENS, R. (1942). Milieux de culture à rendement élevé pour la récolte des spores d'hyphomycètes prédateurs de nématodes. [**Productive Culture Media for Isolating Spores of Fungi Predatory upon Nematodes**].—*Bull. Soc. Path. exot.* **35.** 237–241. **477**

Improved methods are described for obtaining good spore production in cultures of Hyphomycetes for use in ridding soil of nematode larvae [see *V. B.* **10.** 848]. Two media are described. The first is composed of flaked oats, gelatin, meat extract and water, to which finely chopped straw is added, and the second is identical except that the straw is omitted. The purpose of the straw is to provide nodal points on which the fungous spores congregate. When sporulation is at its maximum after about 70 days, the culture is harvested, dried, and used for soil inoculation. When destined for inoculation with soil containing very delicate plant life, such scraps of straw are contraindicated, hence the reason for the strawless medium. In this the spores develop mostly on the flat surface and are harvested by rubbing off in fine sand, which is then dried and used for soil inoculation.

STOWELL, R. E. (1941). **Effect on Tissue Volume of Various Methods of Fixation, Dehydration, and Embedding.**—*Stain Tech.* **16.** 67–83. **478**

In the process of preparing living tissues for sectioning, various changes take place; this paper is concerned with descriptions of experiments which were planned to compare some of the main factors connected with these changes. Similar fixatives show considerable variation in their effects and this is due in part to using them on different tissues, in blocks of various sizes, and according to different procedures, as well as to the variation in composition of the fixatives themselves. When rabbit kidney cortex from which the capsule had been removed was cut into pieces measuring 0·5 × 0·5 × 0·3 cm., complete, uniform, and quick penetration of fluid was obtained. Comparisons were made after fixation in Petrunkevitch's cupric *p*-nitrophenol, Destin's, Orth's and Bouin's fluids, SUSA, Zenker-formol, 10% formalin in distilled water, formalin in saline, Burke's pyridine formalin, $CaCO_3$-neutralized formalin, $MgCO_3$-neutralized formalin, Bensley's vacuum-distilled neutral formalin in distilled water, and Bensley's neutral formalin in saline. Comparisons were also made during dehydration with ethyl alcohol, dioxan and tertiary butyl alcohol followed by clearing in xylol and in chloroform. Infiltration and embedding with parowax, the paraffin-nitrocellulose double embedding technique, and with hot or cold nitrocellulose were also compared. The best fixation results were obtained with SUSA and Bouin's fixatives and the poorest with neutral formalin mixtures. Isotonic salt diluents somewhat improved formalin fixation. When marked reduction in tissue volume is produced by the fixative, the tissues are less liable to further shrinkage during the subsequent processes of dehydration and infiltration. Tissues become distorted and shrunken when subjected to excessive heat, *e.g.* infiltration with hot paraffin produces serious shrinkage while the least shrinkage is obtained with cold nitrocellulose.—C. HORTON SMITH.

THOMPSON, W. R. (1942). **Attachment for Pipets for Precise Transfer of Dangerous Fluids.**—*Industr. Engng Chem.* (Analytical Edition). **14.** 73. **479**

The attachment, illustrated by diagram, serves to obviate oral suction. It consists of an open glass tube constricted at one end and with a side vent in the middle. Fitted around the tube is a rubber bulb. The pipette is attached to the constricted end, filling being controlled by combined manipulation of the bulb and finger closure of the open end of the tube.—J. P. GARDNER.

ANTIPIN, D. N. (1941). Izyskanie metodov hel'mintologicheskogo obezvrezhivaniya konskogo i korov'ego navoza. [**Methods of Killing Helminth Eggs and Larvae in Cattle and Horse Manure**].—*Veterinariya, Moscow.* No. 2. pp. 42–56. [French summary]. **480**

A. discusses the literature concerning the conservation of dung and describes numerous experiments on conservation of horse and cow dung by the "hot" or Krantz's method [consisting in aeration for several days before compression] and by the "cold" method [compression with frequent application of water or urine]. He concludes that if horse dung is kept by the "hot" method in dung pits from December to March, it will be free from helminth eggs and larvae. If, between March and May, dung is kept in this way, but in "open squares", nearly complete sterilization is ensured, but eggs situated in the lower layers of the dung heap remain viable. It was shown that it is not advisable to keep horse dung by the "cold" method of conservation since even during very cold weather in the winter (–35°C.), it was found impossible to prevent the temperature of the dung from rising to 70°C. and above, with resultant deterioration. Loss of N is considerably reduced (to 7·55%) if 2% superphosphate is added to the horse dung. The best method of eliminating helminth eggs and larvae from cow dung is to combine it with horse dung; not less than 4 kg. of straw litter per head must, however, be provided daily for the animals. Cow dung from animals on turf litter cannot be successfully kept by the "hot" method of conservation. When cow and horse dung are combined, sterilization is not ensured when the dung is conserved by the "cold" method.—E. R. PARISER.

SCHACHMAN, H. K. (1942). **An Alignment Chart for the Computation of Ultracentrifugation Results.**—*J. biol. Chem.* **143.** 395–402. **481**

The construction of an alignment chart is described by means of which sedimentation data can quickly be computed to give sedimentation constants. With the chart, viscosity and density corrections can be made for reducing sedimentation constants to the standard conditions, in water at 20°C.—R. A. KEKWICK.

MISCELLANEOUS

IRWIN, J. O. (1942). **The Distribution of the Logarithm of Survival Times when the True Law is Exponential.** —*J. Hyg., Camb.* **42.** 328–333. 482

The author refers to the work of WITHELL [*V. B.* **12.** 561.] who showed that for a wide range of organisms and disinfectants the logarithms of the survival times are approximately normally distributed, but he points out that in many cases the data are insufficient to distinguish between two hypotheses (1) of a constant force of mortality K and (2) of a normal distribution of the logarithm of the survival times. Mathematically it is shown that the distribution is independent of K except for the position of the mean. Consideration is given to the distribution of the logarithm of the survival times when the time law is exponential. By calculation it is shown that the normal approximation always slightly underestimates the percentage of survivors and it is pointed out that extremely good data are necessary to distinguish between the two hypotheses. The reader is referred to the original for the detailed mathematical exposition of the discussion.—ALFRED EDEN.

REPORTS

U.S.A. PANAMA. (1942). **Annual Report of the Gorgas Memorial Laboratory 1941.** [CLARK, H. C.] pp. 25. Washington, D.C.: U.S. Govt. Printing Office. [8vo]. 483

This year research on animal trypanosomes was further developed and as a result it is claimed that the causal organism of "murrina" of horses, which has been called *T. hippicum*, is identical with *T. venezuelense*; it differs from *T. evansi* in agglutination characteristics and in its method of division, and it is suggested that this trypanosome may belong to the *T. congolense* group. [The trypanosome resembles *T. evansi* morphologically, in its pathogenic activity and its reaction to drugs.]

T. vivax has been found to be much more prevalent in Panama than was supposed. It is said to cause loss of weight and appetite in cattle, infection being associated with lachrymation and swelling about the eyes and face. Four calves out of five inoculated with the parasite succumbed, but the mortality in control calves is not disclosed. It is considered that "if rigid control and widespread treatment is not instituted in a reasonably short time, the cattle industry will be confronted with a serious economic problem".

In work on the effect of keeping small experimental animals in a room cooled to 68°F., it was found that such animals were more active, consumed more food, grew more rapidly, and matured more quickly than those kept under tropical conditions. The haemoglobin value of the "cooled room" animals was higher than in those kept outside.

The report also contains a few notes on the Tabanidae and ticks encountered in Panama, but the detailed information on entomological work has been issued in special publications.—U. F. RICHARDSON.

U.S.A. (1941). **State of California, Department of Agriculture. [Report of] Division of Animal Industry [1940].** [DUCKWORTH, C., U.]—*Bull. Dep. Agric. Calif.* **29.** 352–385. 484

More cattle were fed in the state of California than ever before. The number of dairy cows continued to increase, but the lamb crop was smaller.

6,613,918 animals were slaughtered during the year, and 95% of the meat and meat food products consumed in the state were produced under Federal, state, or state approved municipal inspection.

The bovine TUBERCULOSIS eradication campaign has resulted in a large decrease in the number of cattle carcasses condemned on account of TB. During the year, the last six counties in the state were designated as modified accredited bovine TB.-free areas.

205 herds, representing 11,818 animals, were certified as having passed three successive semi-annual negative agglutination tests for CONTAGIOUS ABORTION.

VESICULAR EXANTHEMA involved over one-fourth of the pig population of the state. Raw garbage was being fed on the great majority of infected premises.

LIVER FLUKE control in sheep was carried out and vaccination with *Clostridium oedematiens* bacterin was very successful in preventing losses in the acute stage of the disease.—H. V. HUGHES.

I. U.S.A. (1940). **Report of the Regional Poultry Research Laboratory, East Lansing, Michigan, January 3, 1939, to June 30, 1940.** [MARTIN, J. H.] pp. 20. [4to] [Mimeographed]. 485

II. U.S.A. (1941). **Second Annual Report of the Regional Poultry Research Laboratory, East Lansing, Mich. July 1, 1940–June 30, 1941.** [WINTON, B.]. pp. 29. [4to] [Mimeographed]. 486

I. This first report of the Regional Poultry Research Laboratory contains the names of the Directors and collaborators of the 25 co-operating state agricultural experiment stations of the north-eastern and north central states and of the personnel of the laboratory. At a meeting of the co-operating states it was felt that a committee of 25 collaborators would be unwieldy. It was therefore decided to appoint an advisory committee consisting of nine of their number.

The problem of FOWL PARALYSIS is being investigated from two angles, *viz*, genetic and pathological. The object of the genetic work is to identify strains of poultry according to their resistance or susceptibility to F.P. and to determine the effectiveness of breeding for resistance and susceptibility to F.P. The methods which are being adopted, and the difficulties which have been met, are discussed. Studies on the pathology of F.P. are designed to determine the disease-inducing capacities of inocula from several sources and the characteristics of the disease induced. Studies of the cytology and anatomy of the fowl are being made in order to determine the normal and pathological variations.

Of five strains of lymphomatous material employed as inocula, three gave satisfactory evidence of transmissibility. One strain, which gives a predominantly leucaemic picture, has been carried through numerous serial passages in young chicks.

The research programmes which are being carried out at nine of the co-operating state agriculture experiment stations are briefly described.

II. It has been estimated that the annual loss, in the U.S.A. alone, due to adult fowl mortality is more than $100,000,000, more than half of which is caused by avian LEUCOSIS. The Regional Poultry Research Laboratory was established by authority of Congress in recognition of the economic importance of disease to the poultry industry.

In order to study FOWL PARALYSIS, extensive use has been made of artificial inoculation to determine the transmissibility and the nature of the manifestations produced by different inocula. The results are as follows.

Tests were carried out over two consecutive years to test the infectivity of the avian leucosis complex. With 1939 birds, 13% of 870 controls, 49% of 618 inoculated birds, and 23% of 338 birds in contact with

inoculated birds became affected. The figures for 1940 birds are 9% of 447, 37% of 345, and 21% of 150.

In studies of the nature of manifestations produced in fowls by different types of F.P. strains, the following results were obtained. With Michigan 1 strain (lymphomatosis) in observations on 256 birds, 0·8% developed ocular manifestations, 16% neural, and 19·5% visceral. With Michigan 2 strain (lymphomatosis), in 129 birds, there were 0·8% ocular, 5·4% neural, and 36·5% visceral manifestations. With Missouri strain (lymphomatosis-osteopetrosis), there were 10·1% neural, 35·2% visceral, and 13·4% osteopetrotic manifestations; [total no. of birds not given]. The Beltsville strain produced leucotic symptoms in 51·2% of 371 birds. Among 254 uninoculated controls, there were 3·5% neural and 11·4% visceral lesions.

In observations on the sex incidence of avian leucosis, it was noted that 379 females and 235 males among inoculated birds were affected (ratio incidence 1·2 : 1). 191 females and 135 males (1·8 : 1) were affected among birds in contact with inoculated birds. Of uninoculated controls 500 females and 331 males (1·7 : 1) were affected.

Embryonated eggs were used in an attempt to find the most satisfactory route of inoculation for inducing avian leucosis. When inoculation was made into the amniotic cavity, hatchability was 48%, and leucosis incidence in chicks hatched was 30%. With intravenous inoculation the corresponding figures were 17% and 4%. In uninoculated eggs the figures were 60·5% and 5%.

In correlating the gross and microscopic findings in 632 cases, it was found that 23·4% considered negative on macroscopic examination were positive on microscopic examination. On the other hand, gross lesions were verified on microscopic examination in all but 0·95% cases.

Observations were made on the incidence of embryonic abnormality, growth and adult body weight. A lethal factor causing the absence of both wings or only vestigial wing appendages was discovered. Observations suggested that there are genetic differences in the ultimate weights of the strains studied.

The results are summarized of work on avian leucosis being carried out at 12 of the co-operating state agricultural experiment stations.—F. O. Asplin.

Hansen, P. (1941). Uddrag af Veterinaerdirektoratets Beretning for Aaret 1939. **[Extract from the Report of the Veterinary Directorate, Denmark, for 1939].**—*Skand. VetTidskr.* **31.** 183–190, and 249–253. **487**

The history of the great Foot and Mouth Disease epizootic is outlined up to September 1940, when it was considered to have come to an end. During 1939 it was quiescent but it flared up for the second time between December 1939 and April 1940, so that by September 4,800 herds had been infected, most being in Sjaelland. Many herds infected in 1938 were reinfected and it was determined that type A virus was chiefly responsible. [The previous outbreak was due to type O virus.] Statistics for the second outbreak (1939) are given in tables and in a chart and map, showing incidence, direct and indirect losses, and serum treatment. About 5½ million kroner were paid in compensation for loss. A summary of Danish experience with adsorbed virus vaccine is given. By September 1940, 21,466 litres of monovalent and 39,000 litres of bivalent vaccine had been issued. Results were considered to have been very good.

There were 34 outbreaks of malignant Foot Rot in sheep: control by slaughter plus compensation for loss was continued.

In the campaign against Bovine Tuberculosis 683 cows were slaughtered on account of pulmonary or uterine TB. 24,500 herds were tuberculin tested and 748 (14·8%) of 5,050 of them which were tested for the first time were found free from infection. Tests on 24,500 special dairy herds showed that 6·3% were infected (2·7% of the animals reacted). 124 poultry flocks were tuberculin tested and 75 (60·5%) were found to be infected (9·5% of the fowls reacted).

1,755 out of 5,707 blood samples were positive for Brucellosis.

The following numbers of outbreaks of other diseases occurred and the following numbers of animals (given in brackets) were infected:– strangles 2,003 (5,168), anthrax 142 (155), swine erysipelas 1,149 (2,954), swine plague 3,054 (21,857), calf diphtheria 263 (1,428), blackleg 23 (39), ringworm 1,050 (5,455 bovines), 8 (13 horses) and 470 (2,058 pigs), equine pustular stomatitis, 32 (57), cow pox 481 (4,468), bovine malignant catarrh 22 (29), dog distemper (711), equine infectious paraplegia 10 (22), equine mange 12 (37), bovine mange 14 (115), and porcine mange 697 (5,094). A few other diseases are also noted.

Figures are given for the results of P.M. and blood test work on poultry diseases and for animal infections in man.

The livestock census showed 594.000 horses, 3,326,300 cattle, and 3,182,800 pigs. Figures are also given for fur animals.—J. E.

U.S.S.R. (1939). Iz godovovo otcheta o rabote VIEV za 1938 g. **[Annual Report on the Work of the Institute of Experimental Veterinary Medicine for 1938].**—*Sovyet. Vet.* No. 5. pp. 89–90. **488**

The institute comprises 19 laboratories, and a number of auxiliary units, the nature of which is not disclosed. During the year, 73 graduate research workers, 34 "aspirants", 39 post-graduate workers, 28 epizoologists, and five consulting specialists worked permanently or temporarily in these laboratories.

One of the functions of the institute being the planning and co-ordination of veterinary research, 330 research programmes of 36 peripheral laboratories were examined and advised upon. A general plan for veterinary research was drawn up by the institute for the first time in 1938, and 582 research subjects were allotted to various institutes, laboratories, colleges, and universities. Of these subjects 42 related to protozoology, 37 to helminthology, 34 to brucella infection, 19 to equine infectious anaemia, 18 to various swine diseases, 9 to tuberculosis, Johne's disease and glanders, 8 to infectious jaundice, 7 to fowl diseases, 6 to sheep diseases, 6 to anthrax, 4 to calf diseases, 3 to hygiene, etc.

The institute has issued a booklet entitled "Rules of Evidence in Scientific Research", the object of which was to remedy deficiencies in the marshalling of evidence. In addition to these "Rules", 30 instructions and sets of rules relating to various problems were drawn up, oral and written advice or opinion given in 1,546 cases, 4,318 diagnostic examinations made, 66 lectures given, and two post-graduate courses organized for the veterinarians of the meat combines.

Agul'nik, M. A. (1940). Itogi raboty XV plenuma veterinarnovo otdeleniya Vsesoyuznoĭ akademii s.-kh. nauk im. V. I. Lenina po vetsanitarii i zoohigiene. (21–25 Febralya 1940 g.) **[Report of Proceedings of the 15th Plenary Session of the Veterinary Section of the Academy of Agricultural Science, 21st-25th February, 1940].**—*Sovyet. Vet.* No. 4. pp. 6–10. **489**

This is a report on the progress achieved in veterinary and sanitary control of foodstuffs, especially meat and meat products. Data are given on abattoir technique, disinfection and preservation of animal products, the treatment of meat and hides of diseased animals, training of personnel, and plans for further research.

BOOK REVIEWS

MACKIE, T. J. [M.D., D.P.H., Professor of Bacteriology, University of Edinburgh], & MCCARTNEY, J. E. [M.D., D.Sc., Director of Research and Pathological Services, London County Council]. (1942). **Handbook of Practical Bacteriology. A Guide to Bacteriological Laboratory Work.** pp. xi + 675. Numerous figs. Edinburgh: E. & S. Livingstone. [6th Edit.] [8vo] [17s. 6d.]. **490**

This well known book has now reached its sixth edition, and although the arrangement of the work is essentially the same there are many additions and alterations bringing the text up to date. The section on the filtrable viruses has been expanded, both on the purely technical side and in respect of the more general advance in the knowledge of these organisms. Among other additions are details on the laboratory diagnosis of psittacosis, and the diagnosis of bovine streptococcal mastitis using Edwards' crystal-violet aesculin blood agar. In an appendix there is a discussion on the mode and action of sulphonamide compounds and the use of *p*-aminobenzoic acid in culture media, as well as a brief note on the bacteriological examination of air. The book retains its essentially practical bias, while still providing the necessary background of up-to-date general bacteriological knowledge. It will continue to be invaluable to all engaged in practical bacteriology.

—D. L. HUGHES.

PEARSE, A. S. [Professor of Zoology, Duke University]. (1942). **Introduction to Parasitology.** pp. ix + 357. 448 figs. Springfield, Ill.: Charles C. Thomas; London: Baillière, Tindall & Cox. [1st Edit.] [8vo]. [$3.75]. **491**

In the preface to this book the author states that "an attempt is made to survey the field of parasitology briefly, especially for college students. Particular emphasis is placed on animal parasites which infest man". The claim to have surveyed the field briefly is justified, for in little more than three hundred pages the reader is taken phylum by phylum, frequently order by order, and sometimes family by family, through the parasitic members of the whole of the animal kingdom, from the Protozoa to the Chordata. Indeed, the amount of material packed into the book is astonishing, and one wonders if there is not too much, if, in fact, there is the danger of the student's not seeing the wood for the trees. Usually, and particularly so in the biological sciences, an introduction to a subject is meant to stress principles, and to avoid the obscurity which so easily results when too many examples, often little more than a list of names, are introduced. Saying something about everything also has other disadvantages of which the most serious is, perhaps, the oversimplification, and sometimes dogmatism, which tends to accompany brevity. Examples of these faults will be found in the chapter on malaria, in the short discussion on the physiology and control of helminths, and in the account of some of the life-cycles, notably that of *Strongyloides stercoralis*. In fairness to the author, however, it must be pointed out that he intends his book to be an accompaniment to lectures, or to a supervised course in a biological department, and in that capacity it can be confidently recommended. It can be recommended also to those doctors and veterinarians who are interested in parasitology as a whole, and who would like to know something of the innumerable parasites which exist whose economic interest is so little that they are not discussed in ordinary class texts. It will be clear, however, that the book is too generalized to serve as a class book for medical and veterinary students.

The illustrations are for the most part diagrammatic, and are clear and plentiful. The classifications adopted are modern, *e.g.* the classification of the Trematoda takes cognisance of the larval excretory system and that the Nematoda is Chitwood's. Each chapter includes a useful list of references to relevant monographs or textbooks. Finally, it must be mentioned that it is a pleasure, appreciated nowadays more than ever, to handle a book so well printed and well bound.—D. G. DAVEY.

FRANK, E. R. [B.S.A., D.V.M., M.S., Professor of Surgery, Kansas State College of Agriculture and Applied Science, Manhattan, Kansas]. (1942). **Veterinary Surgery Notes.** pp. 258. 183 figs. Minneapolis, Minn.: Burgess Publishing Co. [4to] [$5.00]. **492**

This book, like one on practical physiology by BERGMAN & HEWITT [*V. B.* **12.** 191.] and another on practical bacteriology by MERCHANT & KARLSON [*V. B.* **12.** 254.], is printed and set up by a photographic process from typescript on loose, but not interchangeable leaves. The length of the line ("measure") is wide. Reproductions of photographs are included and have come out fairly but not very well.

The author has unfortunately written no preface to this book on veterinary surgery, so that it is difficult to know exactly what role the book is intended to play. It seems to be an attempt to publish a very interesting collection of case records of surgical diseases in farm animals and at the same time to be a system of veterinary surgery. The material presented, however, is too cursory to give students a good grounding in the essentials of general surgery. It is suggested that better results would have been reached by keeping to the case record plus discussion plan, on the lines of a valuable book published many years ago, *viz*, CADIOT'S "Studies on Clinical Veterinary Medicine and Surgery", which was translated into English by DOLLAR in 1900. In this way the book would widen the student's clinical knowledge and prepare him for practical experience, and would thus be very helpful and popular.—J. E.

BIERER, B. [V.M.D.]. (1939). **History of Animal Plagues of North America. With an Occasional Reference to Other Diseases and Diseased Conditions. Part 1, Part 2, Part 3, Part 4 and Part 5.** pp. 114. [Numerous refs.] Baltimore: The Author. [4to] [Mimeographed]. **493**

The subtitle aptly describes the structure of this work, which consists in the main of extracts quoted *in extenso* from agricultural and veterinary journals and official reports. These are set out in chronological order, the author considering that this helps to a better understanding of the situation. If the history of any one plague or disease is desired, recourse must be had to the index. The work is evidence of an immense amount of industry, and it will be useful as a work of reference to anyone who wants a bibliography of animal plagues in North America.—F. BULLOCK.

BIERER, B. W. [V.M.D.]. (1942). **A Survey of Municipal & State Meat Inspection.** pp. 21 + 7. Numerous tables. Baltimore: The Author. [4to] [Mimeographed]. **494**

This little work purports to give in summary fashion a statistical account of the development of meat inspection in the U.S.A. The new Federal Meat Inspection Law of 1906 followed immediately on the exposure of the unsatisfactory state of the products of Chicago meat-packing houses; it gave the Department of Agriculture power to formulate regulations for meat inspection as applied to interstate and export business. The different states and municipalities have their own systems of meat inspection. In 42 out of 50 of the largest cities meat inspection is carried out by veterinarians. Out of the 48 states there is veterinary meat inspection

in only 17, and of these only five have a complete *ante* and *post-mortem* inspection. In 68 out of 162 cities with under 100,000 population, veterinarians carry out meat and milk inspection. According to the information, which he has collected, the author outlines what he considers should be the aim in food inspection in states and municipalities.—F. BULLOCK.

SMILEY, D. F. [A.B., M.D., Professor of Hygiene and University Health Officer in Cornell University], & GOULD, A. G. [Ph.B., M.D., Assistant Professor of Hygiene and Attending Physician in Cornell University]. (1941). **Community Hygiene.** pp. xi + 448. 121 figs. New York: The Macmillan Company. [3rd Edit.] [8vo] [$2.50]. **495**

This is an excellent American text-book on human hygiene, complete with data of North American origin and, as such, useful for reference. There are four sections with 25 chapters, the sections covering environmental health hazards, (which includes information on food hygiene and on animals as a source of disease in man), community attack in specific diseases, health problems specific to certain groups, and health agencies. There are numerous good illustrations, charts, etc., and additional reference lists after each chapter. The chapter on animals as sources of infection for man deals with the subject briefly in a general way, but tells nothing about the incidence of the diseases in the U.S.A.

The book is very well printed and produced.—J. E.

WOOLDRIDGE, W. R. [Ph.D., M.Sc., M.R..CV.S., Lecturer in Biochemistry at The London School of Hygiene and Tropical Medicine]. (1942). **War Gases and Foodstuffs. Chemical Warfare and Food Supplies.** pp. iv + 50. 3 plates. London: Leonard Hill Ltd. [8vo] [2s. 6d.] **496**

This small book gives a short introduction to the poisonous "gases" likely to be used in warfare and a comprehensive review of the available knowledge concerning their effects on foodstuffs, both human and animal; it gives practical measures for protecting these foods from war "gases", measures which can be adopted for the detection of contaminated foods, and methods of rendering them fit for human or animal consumption.

It is an easily readable presentation of the material available in official publications and articles which have appeared in various journals.

Full acknowledgement of the sources of information are given and the references form a very useful index to the bibliography of the subject. It is, however, perhaps a little unfortunate that table II on "War Gases and Their Action on Animals", which was originally prepared by Colonel STORDY as Chief Executive Officer of the National A.R.P. for Animals Committee, is not specifically acknowledged as taken from this source.—H. E. BYWATER.

—. (1941). **The March of Medicine. New York Academy of Medicine Lectures to the Laity, 1940.** pp. xii + 154. New York: Columbia University Press. London: Oxford University Press. [8vo] [$2.00] [13s. 6d.] **497**

This is No. V of the Academy's series of lectures which are intended to interpret recent advances in medical science to laymen. It contains discourses on six subjects, of which three are of comparative veterinary interest, namely "Chemical Warfare against Disease", by P. H. LONG, "The Story of Our Knowledge of the Blood", by P. REZNIKOFF and the "Story of Viruses" by T. M. RIVERS.

For scientific workers these lectures are chiefly interesting for the historical background which they bring out.—J. E.

ANSLEY, A. J. [University College of the South West of England, Exeter]. (1942). **Temperature Control.** pp. viii + 126. 81 figs., 4 appendixes. London: Chapman & Hall, Ltd. [8vo] [13s. 6d.] **498**

The extent to which biological reactions carried out in the laboratory are dependent upon accurate temperature control is not always fully appreciated by the biological research worker. Thermostatic instruments have of recent years been brought to a high state of efficiency by physicists and manufacturers, based on newly discovered principles, and the average biologist is merely content to accept the fact of their existence and accuracy; more detailed information is not readily available. This little book seeks to correlate some of the methods employed in thermostatic control and to bring together information scattered throughout the literature and often not generally accessible.

The treatment is not intended to be exhaustive and description is confined to those methods which have been found to be both dependable and simple. The physical effects for thermostatic control include expansion of solids, liquids and gases; thermo- and photo-electric effects, electrical resistance of solids and salts; and vapour pressure. The methods described apply to the range 0°–1,500°C.

The veterinary research worker will have a special interest in only parts of the book; in view of the wide applications of temperature control throughout the sciences generally there must necessarily be some sections of the book in which the biologist will have less immediate and direct interest. Nevertheless the information given may serve to make him more aware of existing potentialities and of improved instruments applicable to specific problems.

There are some misprints and errors in chemical formulae, and in some sections the electrical wiring diagrams could with advantage have received further explanation to make them more intelligible to the average reader.—ALFRED EDEN.

DARLINGTON, C. D. [F.R.S.], & LA COUR, L. F. (1942). **The Handling of Chromosomes.** pp. 165. 7 figs., 16 plates. London: George Allen & Unwin Ltd. [8vo] [8s. 6d.] **499**

The book covers in detail the equipment, reagents, and the simpler techniques needed in the examination and study of chromosomes. It is designed to form a laboratory manual for the student, teacher, and research worker in genetics and cytology, "who cannot at present get hold of the information they need from any single source". Many original methods developed by the authors are also incorporated. The book contains excellent plates showing chromosome mechanics. A useful list of references on all the technical aspects of chromosome handling is given.—N. J. SCORGIE.

TALICE, R. V., COSTA, R. S., RIAL, B., & OSIMANI, J. J. (1940). Los 100 primeros casos agudos confirmados de enfermedad de Chagas (Tripanosomiasis americana) en el Uruguay. **[Chagas' Disease in Uruguay].** pp. 349. Montevideo: Instituto de Higiene de la Facultad de Medicina. [8vo]. **500**

In this volume the authors deal with the history of Chagas' disease in Uruguay. They give a good general account of the factors involved in the disease as it occurs in human beings. Particular attention is paid to the life-history of the *Triatoma* which are the vectors of the disease, and the various species are illustrated.

The authors examined 60 dogs and cats from *Triatoma*-infested houses and found 13 cats and five dogs to be infected with *Trypanosoma cruzi*. None of these animals showed any symptoms of disease at the time of blood examination, but one dog out of the four animals which were kept under observation, died of the chronic cardiac form of this trypanosomiasis.

—MILLER WATSON.

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